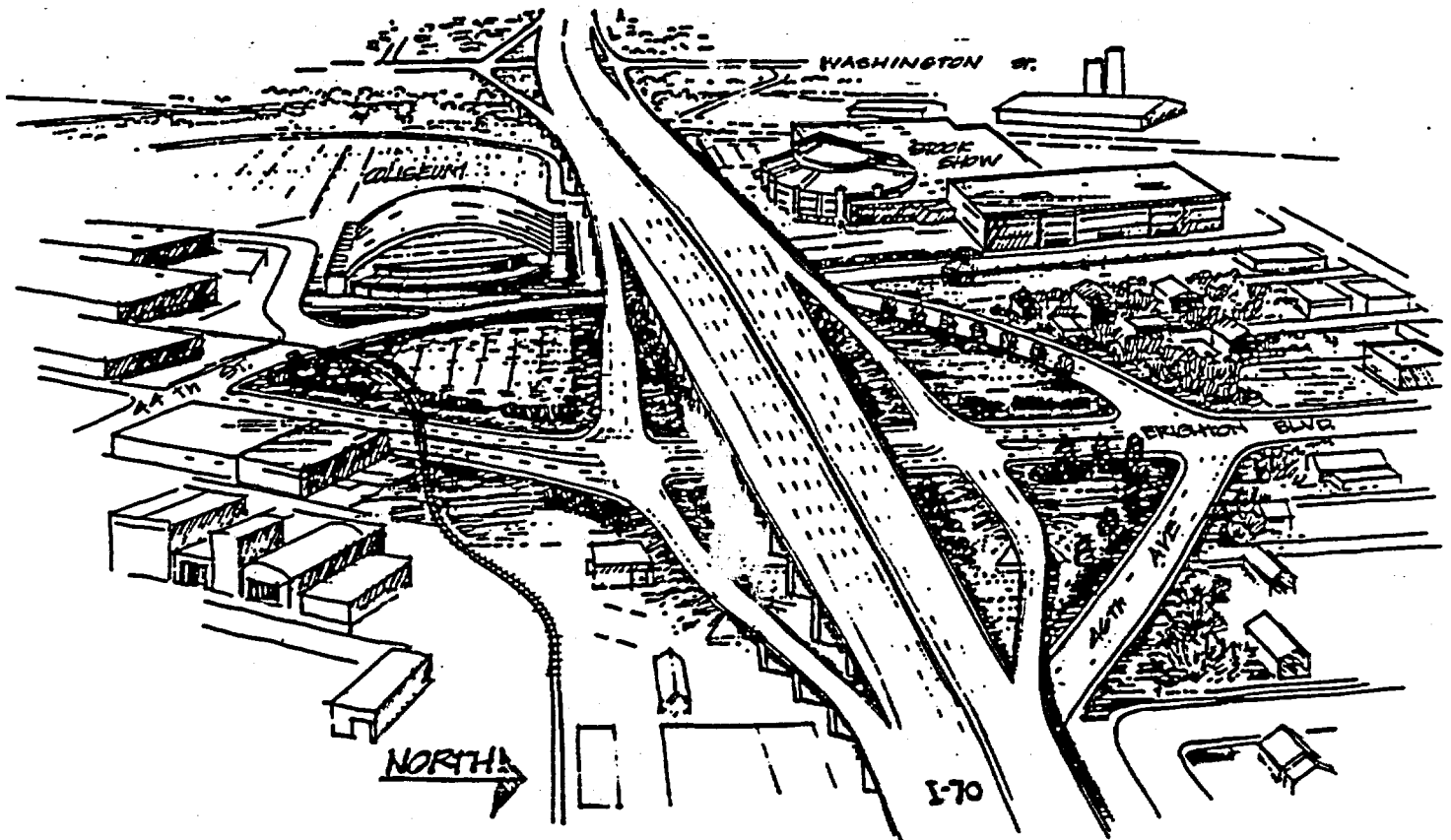


ENVIRONMENTAL ASSESSMENT

I-70/WASHINGTON STREET TO BRIGHTON BOULEVARD

PROJECT IM-IR(CX)-070-4(145)



D 00930

INFORMATION AVAILABILITY

The following individuals may be contacted for further information regarding this document:

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Technical support data for this EA has been provided by the design, environmental, and traffic offices of the Colorado Department of Transportation; and the consulting design firms of Turner, Collie and Braden, Inc., and CRSS Civil Engineers, Inc.

ABOUT THIS ENVIRONMENTAL ASSESSMENT

The potential impacts of widening I-70 between Washington Street and Brighton Boulevard and other associated project elements are evaluated in this Environmental Assessment (EA), and mitigation measures to minimize or eliminate these impacts are proposed.

PUBLIC REVIEW, COMMENT, AND HEARING

A 30-day review and comment period on the EA will be available to the public. The findings of the EA will be summarized at a public hearing held on at a date and location to be publicized. At the hearing and during the review and comment period, the general public will have the opportunity to comment on the project for the record. Written comments are to be sent to the Colorado Department of Transportation to the address noted above.

Substantive comments received by the conclusion of this 30-day period will be addressed in the FONSI.


Based upon the findings of this EA, the impacts of this project can be mitigated and a Finding of No Significant Impact is recommended. The EA and FONSI will become the legally enforceable document which commits the Colorado Department of Transportation (CDOT) and the Federal Highway Administration (FHWA) to the mitigation measures noted within.

ENVIRONMENTAL ASSESSMENT
FEDERAL AID PROJECT IM-IR(CX) 070-4(145)
I-70, WASHINGTON STREET TO BRIGHTON BOULEVARD
CITY AND COUNTY OF DENVER

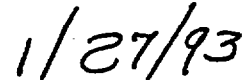
SUBMITTED PURSUANT TO:
42 U.S.C. 4332(2) (C) AND 23 U.S.C. 128(a)
THIS ACTION COMPLIES WITH EXECUTIVE ORDER 11990,
PROTECTION OF WETLANDS

BY
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
COLORADO DEPARTMENT OF TRANSPORTATION

SUBMITTED BY:

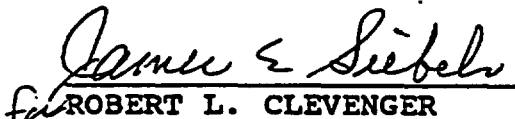


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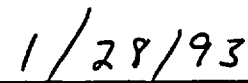


DATE

CONCURRENCE BY:




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COLORADO DEPARTMENT OF TRANSPORTATION

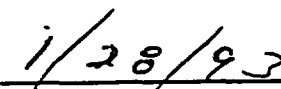


DATE

ADOPTED BY:



GEORGE OSBORNE
DIVISION ADMINISTRATOR, COLORADO DIVISION
FEDERAL HIGHWAY ADMINISTRATION



DATE

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Commonly Used Abbreviations and Basic Definitions

| | |
|---------------|--|
| ACCES | Aesthetic Treatment Criteria (See Chapter 3.12 for definition) |
| BNRR | Burlington Northern Railroad |
| C/D | Collector/Distributor Roadway |
| CDH | Colorado Department of Health |
| CDOH | Colorado Department of Highways |
| CDOT | Colorado Department of Transportation |
| CGI | Combustible Gas Indicator (field instrument) |
| DFD | Denver Fire Department |
| EB | Eastbound |
| EPA | Environmental Protection Agency |
| FACW | Plants commonly found in wetlands (67-99% of the time) |
| FACW+ | Plants found in wetter soils |
| FHWA | Federal Highway Administration |
| HOV | High Occupancy Vehicle |
| HSL | Hazardous Substance List |
| LOS | Level-of-Service |
| MCL | Maximum Contaminant Level |
| Metal | One of 16 metals on the EPA Hazardous Substance List |
| MTBE | Methyl t-Butyl Ether (a common gasoline additive) |
| NB | Northbound |
| NWSS | National Western Stock Show |
| OBL | Plants frequently found in wetlands (greater than 99% of the time) |
| PAH | Polycyclic Aromatic Hydrocarbon (commonly result from burning fuels) |
| PCE | Tetrachloroethene (chlorinated solvent) |
| PID | Photoionization Detector (field instrument to detect volatile compounds) |
| ppb | Parts per billion |
| ppm | Parts per million |
| RCRA | Resource Conservation and Recovery Act |
| ROW | Right-of-Way |
| SB | Southbound |
| SDWA | Safe Drinking Water Act |
| Semi-Volatile | Does not evaporate |
| TCA | 1,1,1-Trichloroethane (chlorinated solvent) |
| TCLP | Toxicity Characteristic Leach Procedure (analytical method) |
| TH | Test Hole |
| UPRR | Union Pacific Railroad |
| UST | Underground storage tank |
| Volatile | Evaporates |
| WB | Westbound |

1.1 DESCRIPTION OF THE PROPOSED ACTION

Executive Summary

The proposed project is just east of the I-70/I-25 interchange (the "Mousetrap"), and is located within the City and County of Denver. The proposed action is to widen I-70 for a three-quarter mile segment between Washington Street and Brighton Boulevard, from the existing six general purpose auto lanes to a new 10 lane roadway. A speed change lane for each direction of I-70 between the Washington Street and Brighton Boulevard interchanges would also be added. These improvements would effectively double the width of existing I-70. The viaduct would be demolished and a new structure and roadway constructed. The project would include reconstructing the interchanges and widening the roadways, at Washington Street and Brighton Boulevard. The I-70 ramps at Humboldt/44th Street would be closed and their function relocated to Brighton Boulevard, and 46th Avenue would be realigned within the project area. (See Figure 1)

Sixteen houses, ten business properties, some vacant lands, and one fire station and its relocation site would be impacted due to the proposed action. These properties are located primarily in the West Elyria neighborhood.

The total estimated project cost is \$70 million dollars including design, right-of-way, utilities and construction costs. Funding for the project is expected to be dependent upon the allocation of federal discretionary funds, but design and ROW activities would be scheduled to meet an anticipated construction start date of 1997. In addition to the roadway improvements, noise walls, sidewalks, a new hike/bike connection to the Greenway trail, special lighting, and landscaping are included in the proposed action.

Summary of Impacts and Proposed Mitigation

The assessment of this proposed project has identified impacts primarily to the social and economic conditions of the local neighborhood and business environment. Many of the negative impacts are non-permanent, construction-related impacts. These potential impacts have been disclosed to the neighborhood and business groups during the conceptual design phase of project development. Due to the interaction with these groups, the project management and design teams have reworked certain project elements to minimize or eliminate the impacts to the local environment. Other impacts are positive due to the proposed action and mitigation. The proposed mitigation measures for this project which supports a Finding of No Significant Impact (FONSI), are summarized below.

1. Construction Impacts

Closures during Construction Initial construction phasing recommendations included the temporary closure of 46th Avenue and the westbound entrance ramp from Humboldt Street and exit ramp to Washington Street for up to two years. This impact has been mitigated by the commitment to keep 46th Avenue open during construction (except for very limited closures during dangerous construction activities) and the proposal to limit the closure of the ramps to four months.

Detour Routes Detour routes have been examined and would be temporarily upgraded if necessary for adequate traffic storage at signalized intersections. Traffic control measures would be utilized where necessary to prevent detour traffic from using Elyria and Globeville neighborhood streets and from crossing private property (eg. at Den-Col Supply). Local access onto and through the detour route would be maintained with special traffic control, if necessary.

DESCRIPTION OF THE RECOMMENDED ALTERNATIVE

1. Replace the existing 6 lane I-70 Viaduct between Washington Street and Brighton Boulevard with a new roadway of fill and structure sections in the same approximate location as existing I-70 with 10 general auto lanes and two acceleration/deceleration lanes and standard shoulders.
2. Widen Washington Street between 45th and 47th Avenues.
3. Replace existing 46th Avenue on a modified alignment between High Street and the BNRR underpass.
4. Relocate the 46th Avenue/Brighton Boulevard intersection between the westbound ramps and 47th Avenue.
5. Close the I-70 Humboldt Street ramps and construct replacement ramps at Brighton Boulevard to create a full diamond interchange.
6. Widen Brighton Boulevard on a westerly modified alignment between 44th Street and 47th Avenue. Relocate the Union Pacific Railroad line across Brighton Boulevard.

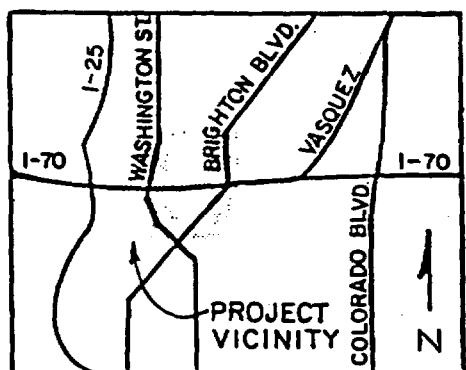
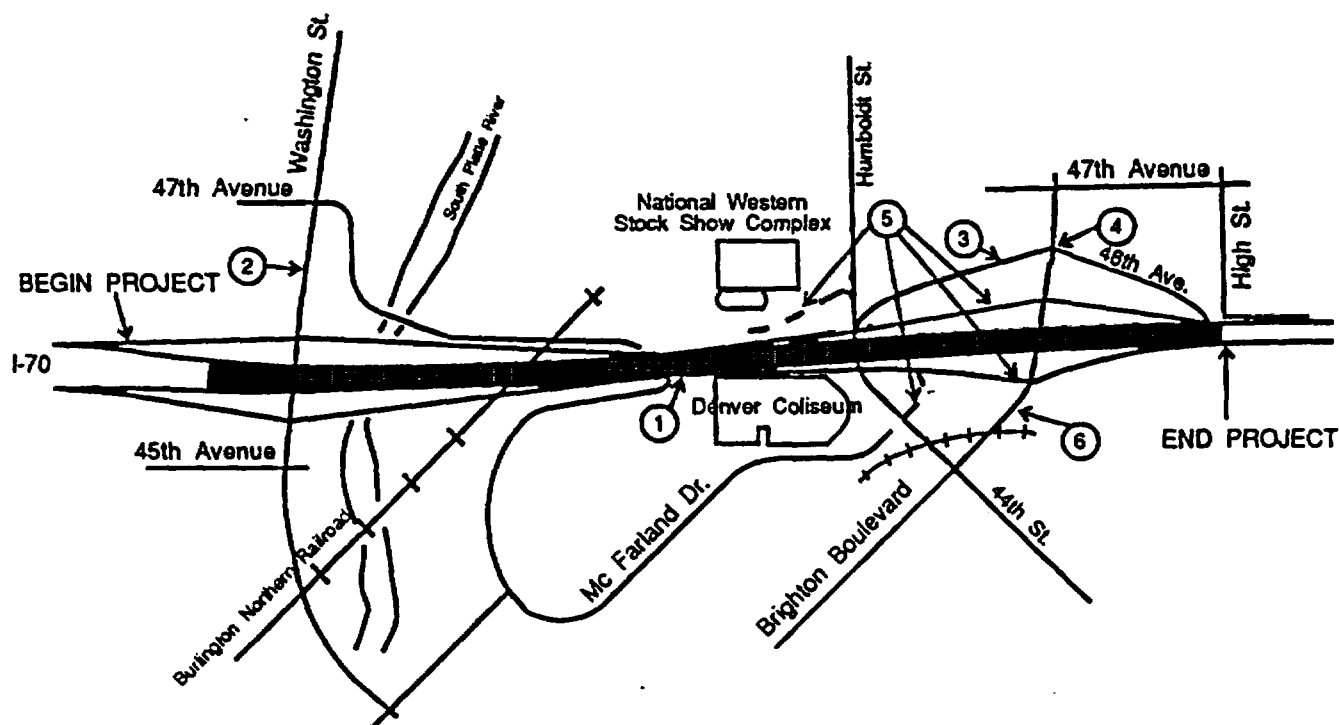


FIGURE
DESCRIPTION OF THE RECOMMENDED ALTERNATIVE
I-70/WASHINGTON TO BRIGHTON BOULEVARD
RECOMMENDED ALTERNATIVE/PROJECT LIMITS

Construction-Generated Dust Dust control measures would be required of contractors and strictly enforced to minimize the regeneration of dust and debris caused by construction activities.

2. Traffic Management

National Western Stock Show and the Denver Coliseum Construction of this project would occur between two regionally significant facilities, the Denver Coliseum and the National Western Stock Show. These facilities are best known as the home of the annual January stock show and rodeos, but both facilities are actively marketed and serve as hosts to other events throughout the year. Many future events are scheduled according to existing contractual agreements. Because of the potential effect of construction on the success or failure of certain events and the risk any failure may place on the existing or potentially renewable contractual agreements, a representative from each facility would be invited to advise the project's construction personnel of event activity so that day-to-day construction activities operate to minimize disruption to the facilities' events. Project Milestones would reflect that no work is to occur between these facilities for the set-up and duration of the January stock show and rodeo, and that all ramps at Washington Street and Brighton Boulevard would be open during this event. The NWSS and the Denver Coliseum would be consulted if any events other than the January stock show and rodeo should be included in the project special provisions.

3. Right-of-Way

Just Compensation and Relocation Services for Acquired Properties This project is expected to impact 16 homes, 10 business properties, vacant lands (the majority of which are used for event parking), and one fire station (plus the fire station's future site). This impact would be mitigated by the property acquisitions and relocations being conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. This act assures that persons displaced by a federally-funded project will not suffer disproportionate injury as a result of a project designed for the benefit of the public as a whole. Relocations and acquisitions would be carried out uniformly for all persons regardless of race, color, religion, sex, or national origin, and in compliance with Title VI of the Civil Rights Act of 1964. Qualifying displaced persons are guaranteed a right to decent, sanitary, and safe replacement homes and no person shall be displaced until adequate housing has been offered. Qualifying displaced persons may be entitled to monetary payments for moving expenses, business in lieu of any other payment, replacement housing supplement payments, down payments, and increased interest payments. Early acquisition for demonstrated hardship cases is to be considered but actual acquisitions would be dependent upon funding.

Fire Station Nine The acquisition of 53-year old Fire Station 9 would be mitigated by providing for a new fire station which includes improvements required by present day local law, codes, and reasonable prevailing standards for similar facilities being built in the City and County of Denver. A replacement site for Fire Station 9 would be selected by the Denver Fire Department which met standards for response time to the Elyria, Globeville, and Swansea neighborhoods. The existing station would not be put out of service until the replacement facility is completed, and until operations can be switched without any interruption to service. To avoid an impact to fire response time due to construction activities, the project special provisions would be revised to require communication on an as-needed basis with the fire department's dispatch center, advising of closed streets and the availability of alternate routes. Traffic control measures to assist fire apparatuses through construction zones would be instituted as necessary and as identified by the Denver Fire Department.

Event Parking This project would impact vacant lands currently used for parking during events at the NWSS or the Denver Coliseum. Adequate parking is an integral component of

each facility's marketability. Potential parking sites could potentially result on lands reconfigured by others due to the changes caused by this project. During the right-of-way acquisition process, simultaneous negotiations are to occur with the NWSS and the City and County of Denver to ensure the best possible distribution of lands between McFarland Drive and Brighton Boulevard. This distribution should reflect the general consensus that new available lands north of I-70 should convert to the NWSS and south of I-70 to the Denver Coliseum although all distribution of lands would need to be in compliance with policies and procedures which govern right-of-way acquisition and disposal. The Elyria neighborhood has expressed its strong desire to have the Brighton Boulevard interchange attractively landscaped. Any potential parking sites made available by others would need to satisfactorily and attractively combine these two uses.

4. **Neighborhood Issues**

46th Avenue Forty-sixth Avenue is the local street which links the Globeville, Elyria, and Swansea neighborhoods. It was a major 4-lane roadway before I-70 was conceived and constructed. These neighborhoods did not support CDOT's recommendation that 46th Avenue be down-sized to 2-lanes to accommodate projected traffic volumes. The NWSS and the Denver Coliseum support a narrow 4-lane roadway as long as the land use beneath I-70 and to either side of 46th Avenue is maximized to support their individual facility requirements and that each facility maintain existing circulation patterns and access locations or comparable replacements. It is recommended that 46th Avenue be reconstructed to remain a 4-lane roadway except between the UPRR underpass and Williams Street where only a two-lane roadway could be provided due to construction constraints and safety issues.

5. **Noise Walls and Splash Protection**

Noise walls are recommended to protect the portion of the East Elyria neighborhood within the construction project limits. Noise walls for the few remaining residential properties in West Elyria would be warranted by predicted noise levels but their installation is not recommended due to NWSS's expansion plans, the inability to construct a continuous barrier, and a high cost per decibel reduction at the homes. Noise walls would be constructed to complete the mitigation in Globeville along I-70 and its ramps west of Washington Street.

Splash protection is expected to be required where the Denver Coliseum is within close proximity to eastbound I-70. This splash protection may be a combination of wide roadway shoulders, overheight bridge rails, and/or other protection.

6. **Landscaping**

The expansion of I-70 would allow for irrigated landscaping to replace non-irrigated slopes between the ramps and I-70, and provide additional landscaping opportunities along Brighton Boulevard, 44th Street, Washington Street, and along and within the loops of 46th Avenue between Humboldt and High Streets. One of the initial benefits of the proposed fill between Humboldt Street and Brighton Boulevard and one of the reasons for neighborhood support of the fill area is the landscaping opportunities inherent with fill slopes. (See item 3 - Event Parking- for additional clarification.)

Landscaping and irrigation systems installed as part of this project would adhere to xeriscape landscaping principles. This project may install a combination of coniferous and deciduous trees, shrubs, flowers, and native grasses which meet the requirements of sight-distance, clear zones, low water usage, mature growth requirements, and reasonable maintenance activities.

7. **Maintenance Issues**

Landscaping A public investment in landscaping requires a maintenance plan to ensure a long-term value. The Elyria neighborhood has asked for a "written commitment" that the

landscaping would be maintained. CDOT would maintain landscaped areas within its rights-of-way at the I-70/Washington Street and Brighton Boulevard interchanges to levels and frequencies commensurate to the number of personnel in its landscaping crews and the amount and types of acreage to be maintained throughout the metropolitan region. The maintenance activities expected to be provided by CDOT includes mowing, tree trimming, weeding, fertilizing, and trash pickup.

Before CDOT can commit to the spending of federal funds for landscaping areas outside of the CDOT's jurisdiction, CDOT would need a written commitment of the local entity to provide maintenance for these areas. Landscaping outside of the interchange ramps along Washington Street, Brighton Boulevard, 46th Avenue, and 44th Street would be under the City and County of Denver's jurisdiction since the city currently maintains these roadways. The city may consider new landscape zoning requirements as recommended for Washington Street in the Washington Street in Globeville Market Study (City and County of Denver, March 1990). The NWSS and the Denver Coliseum may agree to maintain some of the landscaping in their areas.

Landscape maintenance of all planted areas would require approximately 0.30 FTE (full-time equivalent) per year, or an annual expense of approximately \$14,000 for labor, equipment, and supplies.

Local Roadways According to Colorado statute 43-2-132, CDOT is prohibited from maintaining any local roadway or sidewalk system outside of CDOT right-of-way. Therefore all maintenance responsibilities of local roadways construct by this project would be by the local jurisdiction, the City and County of Denver. The local roadways include 44th Street, 46th Avenue, Washington Street, McFarland Drive, Brighton Boulevard (south of I-70), and any other reconstructed residential or city street.

8. **Considerations Given to Bicyclists and Pedestrians**

Historical-type lighting fixtures would be installed along portions of Washington Street to complete an earlier commitment with the Globeville neighborhood. In addition, due to a request from the Elyria neighborhood and to support a safer-feeling environment surrounding and beneath I-70, special lighting fixtures would be installed along portions of 46th Avenue, Brighton Boulevard, and 44th Street. Pedestrian lights would be restored at the BNRR underpass and lighting requirements verified at the UPRR underpass. Denver, per state statute and through its franchise with the Public Service Company, would have to maintain all lighting installed under this project and therefore would have the ultimate approval regarding the installation of lighting.

Sidewalks would be constructed within the project limits along both directions of Washington Street, Brighton Boulevard, 44th Street, and 46th Avenue. Accessibility for bicyclists would be recommended by the Citizen's Advisory Committee (see next item). An access ramp to the Greenway (Platte River) Trail would be installed adjacent to 46th Avenue, along the west bank of the South Platte River.

9. **Aesthetic Treatments, Visual Enhancements**

This project would be constructing a major piece of Denver's infrastructure between two regionally significant facilities, and within some of Denver's oldest neighborhoods. The near doubling of I-70's width would add a sizable structural "cover" over Washington Street and the Platte River, between the NWSS and the Denver Coliseum, and over Brighton Boulevard. In addition, a number of structural columns, retaining and noise walls, and landscaped areas would be built.

The neighborhoods, nearby facilities, and Denver representatives have expressed a serious interest in the visual affect of new I-70, and the need for special attention to the environment remaining beneath I-70. The input of the local communities and the City and County of Denver would be sought in determining the aesthetic treatments of this project through their involvement on a Citizen's Advisory Committee. Aesthetic treatments considered for incorporation would have to meet the ACCES criteria: The treatment would have to be Appropriate for the view, Cost effective within the project's budget, Constructible using reasonable construction techniques, Easily maintainable, and the treatment would have to Support CDOT's standards and policies.

10. Secondary and Cumulative Impacts

The primary cumulative impacts relate to the project's termini, capacity improvements, and the consequences due to potential funding delays. Two of the 10 lanes constructed could not be put into use until I-70 is widened beyond this project's limits. Such widening would cause positive and negative impacts to the Elyria and Swansea neighborhoods. If I-70 were to be depressed between Brighton and Colorado Boulevards, parts of new I-70 would need to be dismantled before the end of their design lives. A significant delay in construction funding would likely trigger the need for a supplemental environmental action to evaluate the logic of the project's Brighton Boulevard terminus. A delay in right-of-way acquisitions could present a particular hardship for elderly residents and business owners near retirement who have been anticipating action by CDOT.

Secondary impacts would be to the change in character at and uses the I-70/Brighton Boulevard interchange, and the contribution the roadway improvements bring to realization of goals of the Washington Street Market Study.

11. Other Environments

Wetlands in the South Platte River would be protected and avoided whenever possible and those impacted would be replaced equally in area; storm drainage and flood control improvements would be incorporated into the project's design in compliance with water quality regulations; and contaminated soils or groundwaters encountered would be handled or disposed as required by regulations. There would be no impact to air quality, to structures of historical significance, section 4(f) or 6(f) properties, and no impacts expected to archeological or paleontological findings, or threatened and endangered species as a result of the completed project.

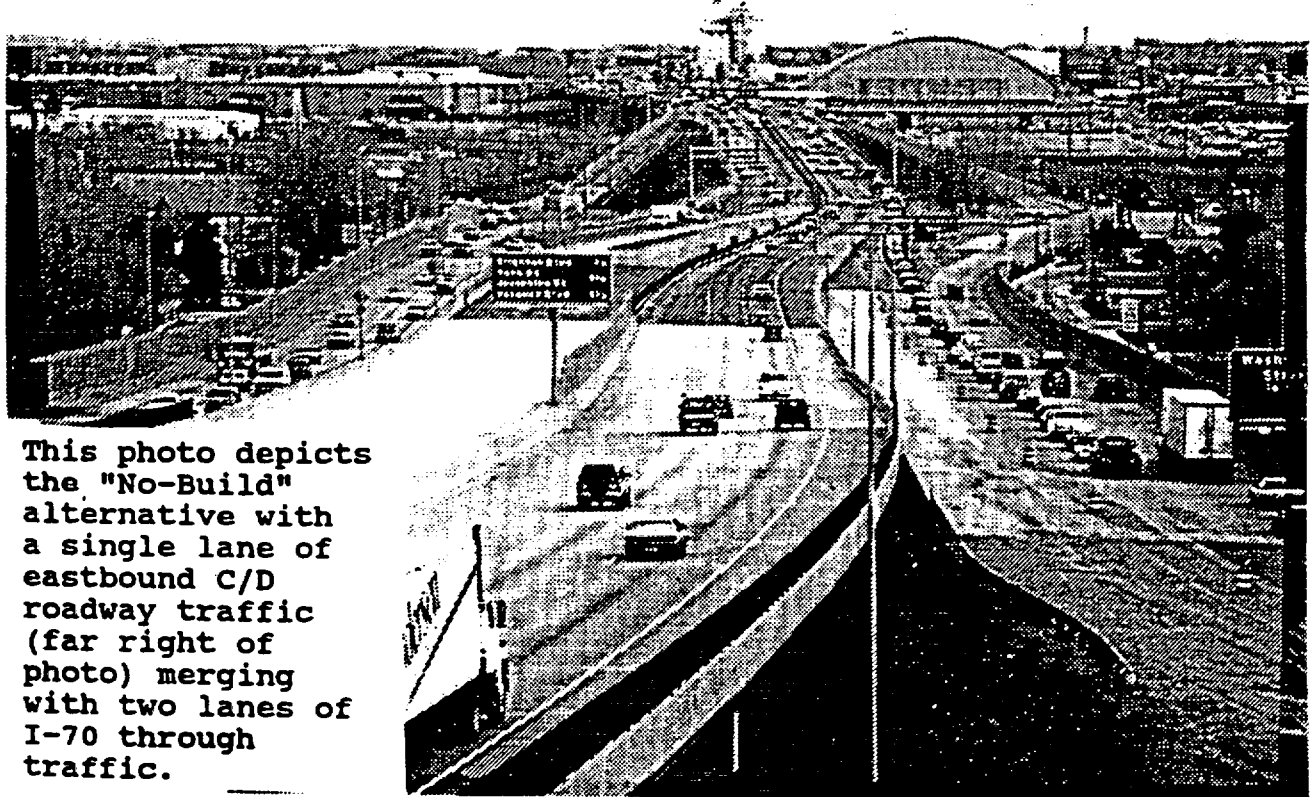
A. PROJECT LIMITS

The western and eastern limits of the project are Washington Street and Brighton Boulevard, respectively. The northern and southern limits are 45th to 47th Avenues at Washington Street, and 44th Street and 47th Avenue at Brighton Boulevard. The area proposed for the relocation of Fire Station 9, between 38th and 42nd Avenues along Brighton Boulevard, is included within the project limits. Preliminary planning conducted for the Combined Systems and Project Level Feasibility Study and Interchange Management Plan for I-70/Washington Street to Brighton Boulevard (CDOT, October 1991) considered extending the project limits east through the York/Josephine Street ramps to completely upgrade the Brighton Boulevard interchange. This extension was dropped due to its impact on the York/Josephine Street ramps; because extending the project would have also precluded future horizontal alignment alternatives (like depressing I-70); because a reasonable alternative which satisfied the project need and which does not preclude future options was identified; and because the need identified by the Federal Highway Administration was to improve operations between I-25 and Brighton Boulevard only; and, a project between Washington Street and Brighton Boulevard is a logical project termini. (See Project Need - I-70/I-25 Studies.)

B. RELATIONSHIP TO OTHER PROJECTS

Reconstruction of the I-70/I-25 interchange began in 1987. Its major features are the removal of I-70 through-traffic from interchange functions, the construction of eastbound and westbound collector/distributor (C/D) roadways between I-25 and Washington Street, and the improvement of the radii, capacity and speed of the ramps to and from I-70 and I-25. I-70 through-traffic is allowed to pass through the interchange on two side-by-side "flyover" structures designed to accommodate six lanes of traffic. By 1992, construction of the "flyover" structures and many of the interchange ramps have been completed. The completion of roadway improvements of the I-70/I-25 interchange is expected in 1993.

The improved ramps to and from I-25 will be served by eastbound and westbound I-70 collector/distributor (C/D) roads. A C/D roadway eliminates weaving and reduces the number of entrance and exit points on the through roadways (i.e. mainline I-70) while satisfying the demand for access to and from the through roadway. The design speed of C/D roadways is less than that of the through roadways because most of the friction caused by weaving occurs on the C/D roadways. The eastbound I-70 C/D roadway constructed under the "Better Mousetrap" project is designed to carry four lanes of ramp traffic between I-25 and Washington Street. Near Washington Street two lanes exit to Washington Street, and two lanes would continue for eventual merging with mainline I-70 east of Washington Street if I-70 is improved as recommended in this EA. Without the recommended improvements, only one lane of C/D traffic can be accommodated onto the existing viaduct. The new westbound I-70 C/D roadway carries two lanes of traffic bound for I-25 plus one additional lane of Washington Street traffic bound for I-25 or I-70. See the discussion under "No Build" for additional information about the relationship to other projects.



This photo depicts the "No-Build" alternative with a single lane of eastbound C/D roadway traffic (far right of photo) merging with two lanes of I-70 through traffic.

I-70 Just East of I-25 - Looking East

C. PROJECT PURPOSE

The purpose of the action is to improve the safety and capacity of I-70 between the interchanges at Washington Street and Brighton Boulevard as I-70 relates to the improvements being accomplished at the I-70/I-25 interchange and in compliance with environmental laws.

D. PROJECT NEED**Regional Transportation Plan for the Year 2010**

The need to increase the number of lanes on I-70 was first recognized during the evaluation of the projected year 2010 travel demands on the regional transportation systems. Studies were initiated by the Denver Regional Council of Governments (DRCOG) during 1986 and 1987 to determine the change or addition in transportation systems which accommodate travel demand due to projected year 2010 population and employment forecasts. In July 1987, after input received from public agencies and the general public at public meetings and a public hearing, the 2010 Regional Transportation Plan (Plan) was adopted by DRCOG. There were no comments at the public meetings or hearing about I-70.

This Plan determined that, among other roadways in the region, the I-70 corridor would require ten general auto lanes to meet the projected transportation demand in this area. The current volume on I-70 (100,000 vehicles per day) is not adequately accommodated by the existing six-lane section. Levels of Service (LOS) are F. (LOS is a term used to describe the relative congestion on a roadway, with LOS A representing a very stable, free flow and LOS F indicating a forced or breakdown flow, see Table C.) The 2010 Plan projects an 80% increase above existing volumes.

Transit Considerations

The Plan incorporated a regional transit system comprised of buses, high occupancy vehicle lanes and rapid transit. However, neither this plan nor a subsequent study by DRCOG recommended the I-70 corridor between Kipling and Peoria Streets as a rapid transit or bus/high occupancy vehicle (hov) corridor since the I-70 corridor met only one of five criteria determined important for success as a transit corridor (Regional High Occupancy Vehicle Lane System (DRCOG, April 1990)). The subsequent study concluded that even with I-70's projected congestion, I-70 would fail to attract or carry the minimum number of transit vehicles, high occupancy vehicles (hov), and total number of persons. Therefore, no transit components are included in the preferred alternative for I-70.

On the average weekday, over 150 buses use I-70 on trips to or from routes throughout the metropolitan area to the bus garages at 31st Street and Ringsby Court or at Colfax and Billings. Another 100 trips have the potential for using I-70 on the average day. All of the current and potential trips are "out-of-service" (no passengers). The only route in service utilizing I-70 is an express run to and from Montbello in northeastern Denver to downtown Denver.

**TABLE A
PROJECT NEED SUMMARY**

- 1) Provide increased capacity and safety for the year 2010 traffic on I-70 between Washington Street and Brighton Boulevard;
- 2) Improve the entrance and exit ramps on I-70 at the Washington St. and Brighton Boulevard interchanges;
- 3) Improve access to and from Brighton Boulevard;
- 4) Improve Brighton Boulevard from 44th Street to 47th Ave. to accommodate the items above;
- 5) Improve the alignment and capacity of Washington Street between 45th and 47th Avenues;
- 6) On I-70, provide improved drainage, crash barriers, expansion joints, and shoulders, to reduce long-term maintenance costs and for the safety of motorists;
- 7) Provide adequate capacity for I-70 during construction and minimize the impacts of construction;
- 8) Provide for adequate capacity and east/west local circulation;
- 9) Provide for noise and splash protection, bicyclists and pedestrians, as warranted;
- 10) Provide an aesthetically pleasing roadway and landscaping project which is also designed to be compatible with land uses; and
- 11) Design I-70 so that it doesn't preclude options for future vertical and horizontal alignments of I-70 east of Brighton Boulevard.

I-70/I-25 Interchange Studies

The need to close the I-70 Humboldt/44th Streets ramps, relocate their function to Brighton Boulevard, and widen I-70, was recognized in a 1988 study (reference below) concerning the impact of full access at the I-70/Washington Street interchange on the operations of the I-70/I-25 interstate-to-interstate interchange. This study concluded that providing full access for Washington Street ramp traffic through the I-70/I-25 interchange could be managed without significantly affecting the operations of the interstate-to-interstate interchange.

The study identified that the more undesirable condition would exist east of the Mousetrap where traffic to and from the I-70 flyovers, the C/D roadway, Washington Street, and Humboldt/44th Streets would all be merging and diverging along substandard distances and in an insufficient number of lanes. This undesirable condition included constrained weaving conditions, minimum speed change lane lengths, and poor ramp geometries. The study concluded that short of denying any access to I-70 between Washington Street and Brighton Boulevard, widening I-70 and relocating the Humboldt/44th Street ramps to Brighton Boulevard would result in appreciable improvements to the operations of I-70.

The Federal Highway Administration (FHWA) accepted the conclusions of the study with the understanding that CDOT pursue the necessary studies to improve I-70 between Washington Street and Brighton Boulevard. (I-70/I-25 Interchange Alternative Analysis for Washington Street, Pecos Street and 49th Avenue Access (CDOH, June 1988).)

Existing Conditions

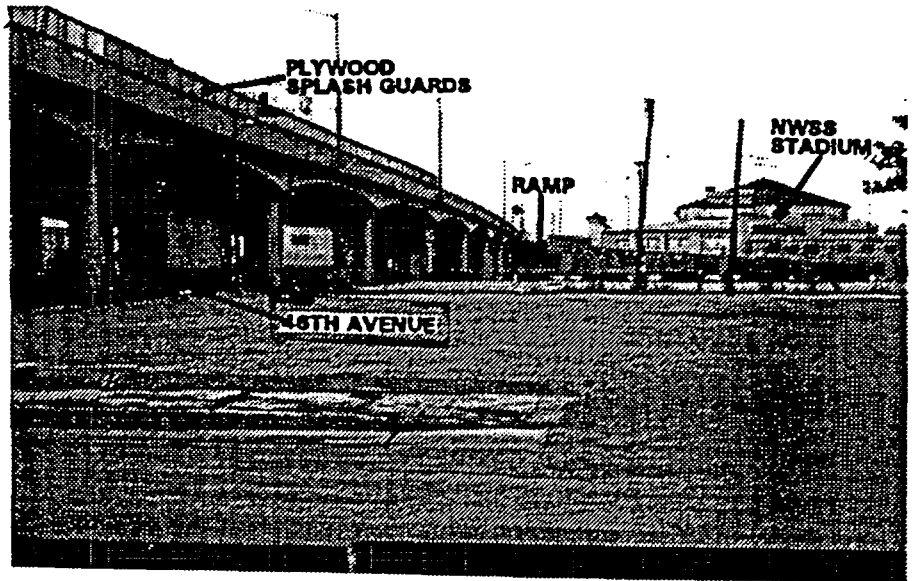
Interstate 70 was conceived to provide major east-west movement across the center of the nation. Because this system is heavily used by the local commuter in this urban area, the

laneage and number of access points required to provide adequate service for motorists varies widely from that in rural areas.

In most of rural Colorado, I-70 is a four lane roadway, and in parts of Denver's urban area the roadway is six to eight lanes wide. Rural interchanges are spaced several miles apart while the distance between urban area interchanges are typically less than one mile. The interchanges in the project areas are spaced about 0.4 miles apart from one another. The Washington Street interchange has a standard diamond configuration. Ramps at Humboldt/44th Streets and Brighton Boulevard provide a split diamond interchange configuration. Humboldt/44th Streets function as the terminus for the western ramps (Humboldt serves the westbound entrance ramp, and the eastbound exit ramp is to 44th Street). Brighton Boulevard is the terminus for the eastern ramps (eastbound entrance ramp and westbound exit ramp). At York and Josephine Streets, interstate ramps provide for westbound entrance and eastbound exit movements. The next full service interchange is at Vasquez Boulevard.

The 9,900 foot long I-70 viaduct from Washington Street to Colorado Boulevard opened to traffic in 1964. From west to east the viaduct spans Washington Street, the South Platte River, the BNRR, Brighton Boulevard, the UPRR, York Street, Josephine Street, and Vasquez Boulevard, plus a number of local streets. I-70 passes under Colorado Boulevard. Forty-sixth Avenue runs parallel at grade beneath the viaduct from the BNRR to east of Vasquez Boulevard where it ties into 48th Avenue at Colorado Boulevard. There is one structural earth fill area between the South Platte River and BNRR.

View of the westbound I-70 viaduct, its numerous columns, and splash guard panels. 46th Avenue is beneath I-70. The short and steep westbound entrance ramp from Humboldt is in the background alongside the NWSS Stadium.



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The typical section of I-70 between Washington Street and Brighton Boulevard consists of three 12-foot lanes, with one-to-two foot shoulders inside and out, in each direction. A 10-foot acceleration/deceleration lane (speed change lane) serves the ramp traffic between Washington Street and Humboldt/44th Street.

The existing I-70 viaduct contains many undesirable conditions. The typical section of I-70 is hampered by the lack of adequate shoulders. Heavily traveled and high-speed highways and those carrying large numbers of trucks should have usable shoulders at least 10 feet and preferably 12 feet wide. I-70 is a high-speed highway and carries a large amount of trucks, but its shoulders are only two feet wide or less. Without shoulders there is no safe refuge for vehicles needing to make an emergency stop, and no storage space for plowed snow. The ramps at Washington Street, Humboldt/44th Streets, and Brighton Boulevard are too short, too steep, too closely spaced, and too low of a design speed for desirable freeway operating conditions. These undesirable conditions with the ramps cause a greater speed differential than desired for vehicles entering or exiting the freeway. The speed change lane between Washington Street and Humboldt/44th Streets is two feet narrower than the standard 12 foot lane.

A 1990 structural analysis of the entire I-70 viaduct resulted in a sufficiency rating of 72.0. For reference, 0 equals worst and 100 equals best; a rating below 50.0 qualifies a structure for replacement or reconstruction. Despite the good rating of the viaduct's structural integrity, its physical condition badly affects rideability. Although the existing viaduct concept was a very acceptable and state-of-the-art design during the 1960's, with expansion joints at an average 240 foot spacing, current structural systems could provide a more efficient superstructure with fewer joints, fewer columns and piers. Since redecking the viaduct in 1980, some joints have been replaced five times, resulting in a reduction in freeway capacity due to lane closures for each repair.

View of westbound I-70 near Brighton Boulevard. Note the narrow shoulders.



Additional lane closures and expenditures are continually required for tightening of joints; flushing and repair of the undersized drainage system; and crash cushion, splash guard, and bridge rail repairs. Rail and splash guard repairs require lane closures because of the lack of shoulders, further depleting the capacity and safety of the viaduct. The bridge rail is not a standard type; it sits on top of a curb, with the system being comprised of a short concrete parapet wall and two-tube aluminum rails. Portions of this section's bridge rail are lined with plywood to prevent the splash of snow and debris from entering properties below.

Accident Analysis

Over 440 traffic accidents have been reported during the three-year period (1989-91) along the I-70 viaduct. The accidents have been primarily rear-end collisions, side-swipe accidents, and guard rail collisions. Most of the accidents occurred during daylight under clear weather conditions. Three hundred persons were injured in these accidents. There were no fatalities. These accidents can be attributed to heavy congestion, inadequate shoulders, poor ramp geometrics, and short weaving/merging distances between the entrance and exit ramps.

The total accident rate along the I-70 viaduct averaged below 1.00. The total accident rate for the Colorado interstate system in urban areas averages 1.59 (1991). The accident rate found on the viaduct indicates that the viaduct has fewer and less severe accidents than those typically found along the interstate system in the urban areas of Colorado.

Other Project Needs

I-70 is Colorado's only east-west interstate highway that crosses the entire state. The facility functions as a very important commercial and recreational travel route. This segment of I-70 also serves intracity travel needs because it bisects the metro Denver area and provides access to adjacent commercial, public facility, industrial and residential uses. Maintaining, to the greatest extent possible, traffic flow on, and ramp traffic to and from, I-70 during reconstruction activities would be necessary. Likewise, minimizing interruption to adjacent land uses and roadways is also an important project goal. (See Project Phasing)

Local Needs

I-70 resides within some of Denver's oldest and poorest neighborhoods. Although most of the impact of this project would be within industrial and commercial areas, the larger and physically different I-70 and associated changes to the local street system would be felt by the surrounding residential neighborhoods. The design of the new I-70 roadway and landscape-able areas, the continued continuity and service provided by 46th Avenue, the accommodation of planned uses beneath I-70, the protection from noise and splash, and the friendliness to pedestrians in an vehicle-dominated environment, are project needs expressed by the local residents.

Future Conditions

To meet the region's projected 2010 traffic demands, significant improvements are planned or are in progress west and east of the subject segment of I-70 at the I-70/I-25 and I-70/I-270 interchanges, respectively. Improving I-70 between Washington Street and Brighton Boulevard would accommodate improvements being implemented to the west to I-25. Future improvements to I-70 between Brighton Boulevard and I-270 to the east would fulfill safety and capacity needs of projected traffic along I-70 to I-270, and would be necessary for all of the I-70 general auto through lanes being constructed at I-70/I-25 and recommended as part of this project, to be operational. Reconstructing I-70 to Brighton Boulevard would provide an important tie to the I-70/I-25 interchange and not preclude alternative vertical and horizontal alignments for I-70 to the east. (See Secondary and Cumulative Impacts)

1.2 PREFERRED ALTERNATIVE

The major components of the proposed action are depicted in Figures 2-10 and are described below. These components developed into the preferred alternative after consideration of the project and local needs, and the design and physical constraints inherent with the project.

The five major components of the preferred alternative are:

- A. Demolish the existing viaduct between Washington Street and Brighton Boulevard and replace a widened I-70 on structures and fill areas along a modified horizontal and vertical alignment.
- B. Close the 44th/Humboldt Streets' ramps and add two ramps to complete the diamond interchange at Brighton Boulevard. Modify or replace the other interchange ramps at Washington Street and Brighton Boulevard.
- C. Widen Washington Street between 45th and 47th Avenues.
- D. Widen Brighton Boulevard between 44th Street and 47th Avenue.
- E. Replace 46th Avenue in its same general vicinity between High Street and the BNRR underpass.

The preferred alternative is compatible with the design and physical constraints of the project:

- 1) It would match the improvements being constructed at I-70/I-25;
- 2) It would meet the requirement to span Washington Street, the South Platte River, the Burlington Northern Railroad and Brighton Boulevard;
- 3) It would align in a reasonable proximity to, and provide for the circulation between, the National Western Stock Show and the Denver Coliseum;
- 4) It would allow for the continuity of 46th Avenue;
- 5) It would maximize the effect of the viaduct's vertical profile on ramp grades; and the gore-to-gore distances between Washington and Brighton Boulevard;
- 6) It would match existing I-70 at Brighton Boulevard; and
- 7) Its alignment would not preclude options for future vertical and horizontal alignments of I-70 east of Brighton Boulevard.

3.2 SOCIAL AND LAND USE

A. ELYRIA/SWANSEA and GLOBEVILLE NEIGHBORHOODS

Neighborhood Locations

This project is located in the Elyria and Globeville neighborhoods, in north central Denver. The Elyria neighborhood was combined with its neighbor to the east, Swansea, for planning purposes by the Denver Planning Office because of the neighborhoods' geographic closeness and the similarity of issues they each face. Therefore, statistical information is provided as a single figure for Elyria/Swansea.

The Elyria/Swansea neighborhoods are bounded by 52nd Avenue, Brighton-Boulevard and 54th Avenue on the north, 38th Avenue and 40th Avenue on the south, the South Platte River on the west and Colorado Boulevard on the east. York Street is the common boundary between both areas, with Elyria occupying the western portion, and Swansea the eastern. I-70 runs east-west bisecting both Elyria and Swansea. For the purposes of this document, Elyria is subdivided into "West" Elyria and "East" Elyria since the majority of project impacts are to West Elyria. Brighton Boulevard divides West Elyria from East Elyria. (See Figure 26)

This project is also located in Globeville, the neighborhood just to the west of Elyria. Within Globeville's boundaries is the I-70/I-25 interchange. Globeville is bounded on the west by a major railroad corridor and on the east by the South Platte River. Globeville is subdivided into "East, Central, and West" Globeville, with West Globeville residing outside of this project's area. (See Figure 26)

B. LAND USE

Elyria/Swansea

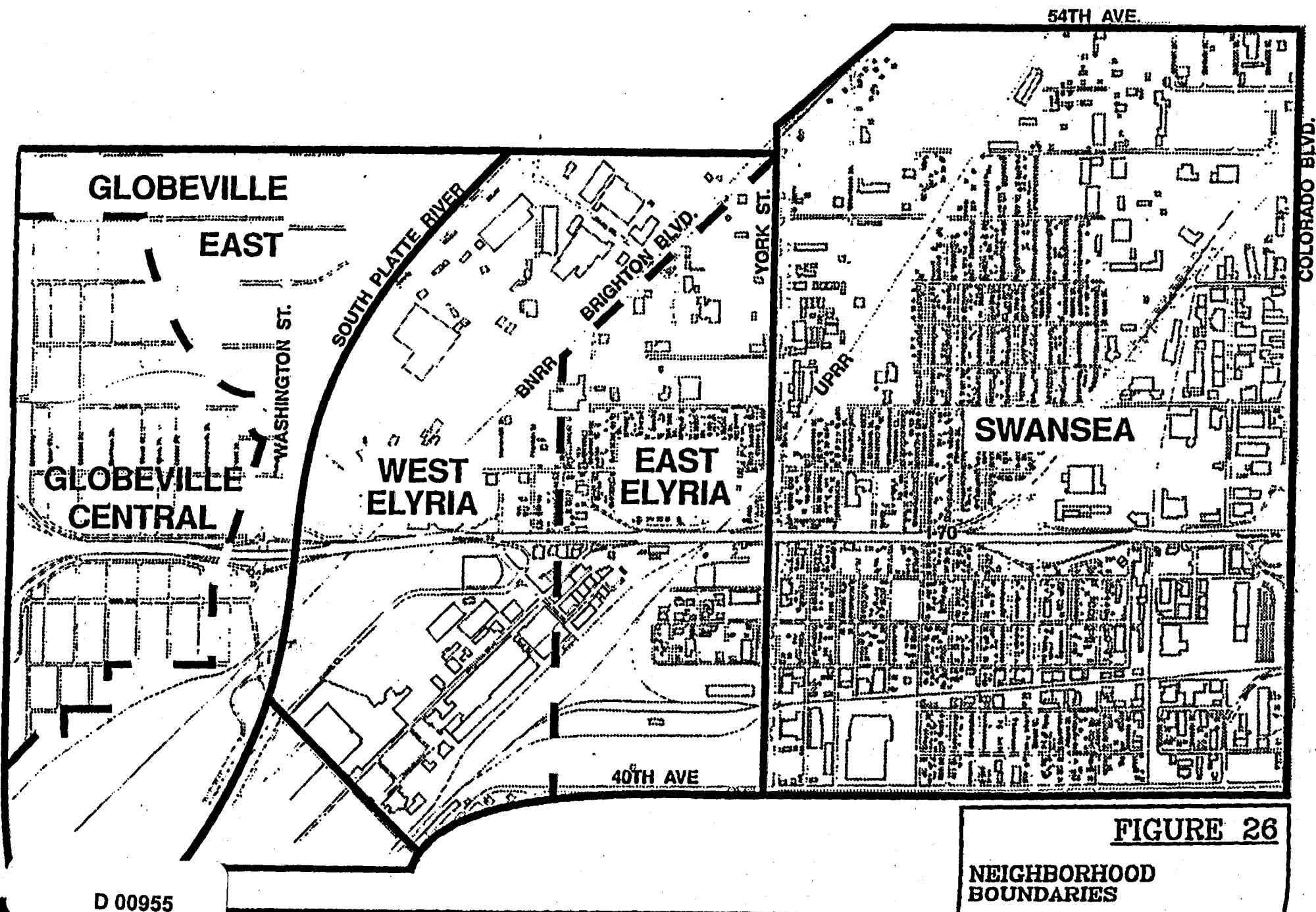
The Elyria/Swansea community is one of Denver's largest neighborhoods in terms of land area with about 1,656 gross acres. Land use is primarily industrial with a large percentage also used for transportation, communication, and utilities. Of the 1,279 total net acres, approximately 476 acres (37%) are used for industry. The next major land use is transportation, communication, and utilities with 296 acres of land (23%).

The relatively small residential portions of the Elyria/Swansea neighborhoods are located in the center and are virtually surrounded by industrial uses. Residential uses comprise 18% of the total acreage, mostly for single-family homes, with only a small percentage containing multi-family units. Of the 224 residential acres, approximately 26 are actually located in industrial zones.

ELYRIA

Elyria's mantle is comprised of industrial, transportation, and commercial land uses. Its core between 46th and 48th Avenues, Humboldt to York Streets, is primarily residential except where the non-conforming residential use in industrial-zoned West Elyria is yielding to commercial and industrial uses. West Elyria was zoned for commercial and industrial use in 1956. East Elyria is zoned for residential.

The presence of the railroads in the 1870's and the smelting industries that located near them prompted the need for nearby housing. The towns of Elyria and Globeville entered the scene in the late 1880's and both were annexed by the City and County of Denver in 1902. During this same timeframe, the cattle and livestock industry took root in West Elyria.



The packing house industry replaced the smelting industry which left the area during the 1900's. The packing house industry remained a strong presence until the 1970's and 1980's when most of the plants shut down or relocated. The shipment of livestock to the packing houses by rail ceased in the 1970's.

Since 1906, the National Western Stock Show Association (NWSS) has been a major land user in West Elyria. The City and County of Denver built the Coliseum to the south of NWSS in 1952. In the 1960's Interstate 70 was built as an elevated roadway over 46th Avenue between the Coliseum and the NWSS stadium. I-70 encroached primarily beyond the northern edge of 46th Avenue and required the loss of approximately 8% of Elyria's housing stock. (See Figure 27)

GLOBEVILLE

Like Elyria, Globeville is also home to large industrial, commercial, and transportation land uses. Globeville's 1,287 gross acres are primarily occupied in the following ways: industrial (27%); streets and highways (23%); rails/communication easements (19%); residential (9%); and public (quasi-public) (7%).

Central Globeville is 88% residential with a few neighborhood-serving businesses. I-70 occupies its core. East Globeville's main feature is Washington Street which is bounded primarily by commercial and industrial uses. West Globeville contains the I-70/I-25 interchange, I-25, businesses to the east and west of I-25, the railroad corridor west of I-25, and a residential enclave in the southwest quadrant of the I-70/I-25 interchange. (See Figure 27)

COMMUNITY FACILITIES

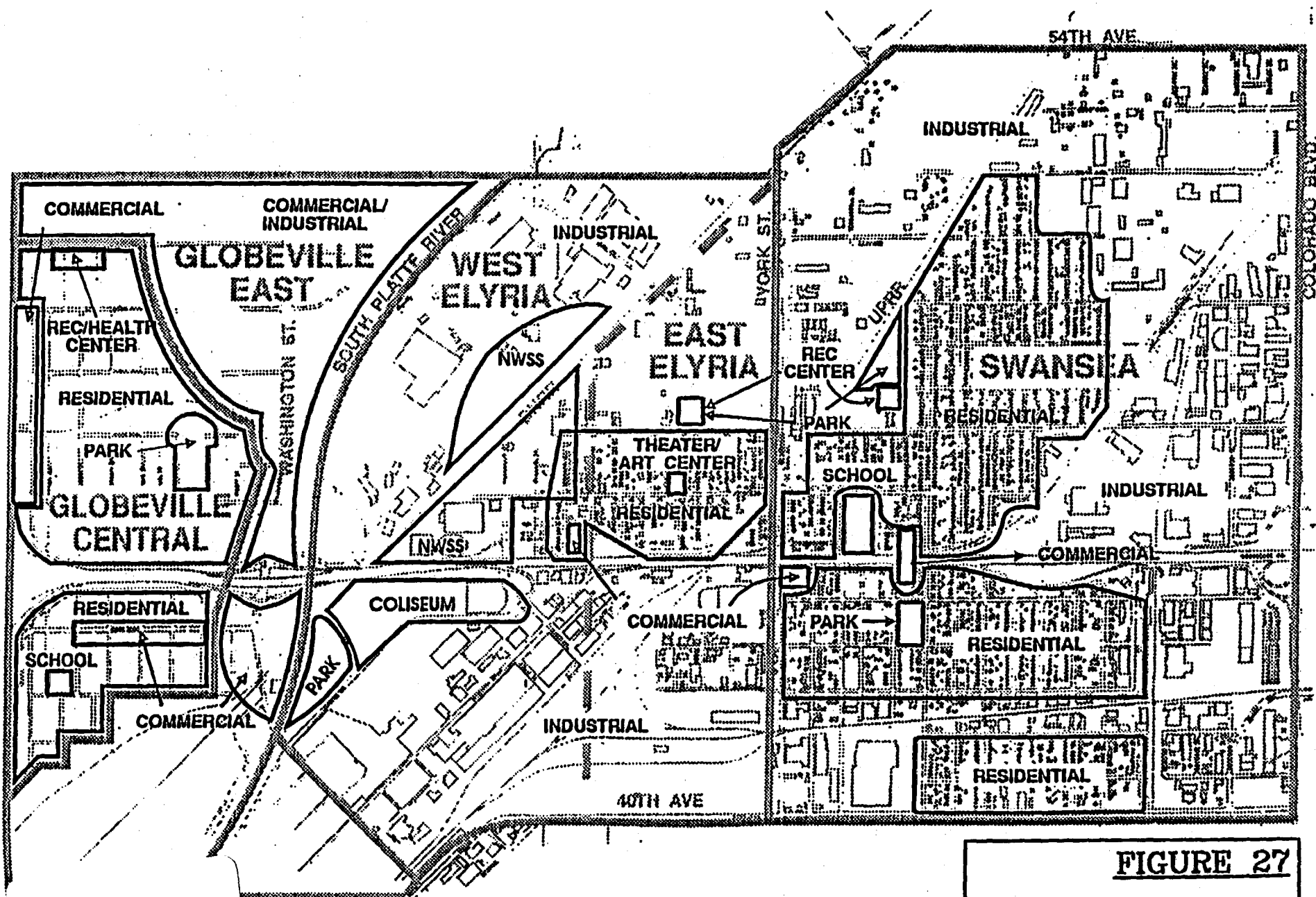
There are several community facilities and services that contribute to the neighborhoods.

Religious Institutions At least five religious institutions reside in Central Globeville and East Elyria. Two of the churches and the leaders of the Holy Transfiguration of Christ Cathedral in Globeville and the Pilgrim Congregational Church in Elyria donate church space and volunteer time for the operations of the Globeville and Elyria neighborhood improvement associations.

Neighborhood and Business Associations Globeville, Elyria, and Swansea each has a neighborhood association, and the Elyria and Swansea neighborhood associations sometimes pool their resources for issues of joint interest. Globeville also has a Globeville Area Business Association with members from Globeville and Elyria businesses.

Recreation and Senior Centers Central Globeville, East Elyria, and Swansea each has a publicly-owned recreation center. Until it closed in 1992, Central Globeville also had another recreation center for juniors. The Police Brotherhood Association is expected to re-institute a recreation program for youths and possibly seniors at the former junior center. The Globeville Senior Center located in Central Globeville closed in 1992 due to under-utilization and budget constraints. Reuse of this center had not been determined at the time of publication.

Health Centers The publicly-owned Globeville Health Center serves the Globeville, Elyria, and Swansea neighborhood. This center provides outpatient services to a primarily indigent or low-income clientele. A privately-owned health center for occupational care is located in East Globeville on Washington Street just north of the Denver city limit and along I-25 just north of the I-70/I-25 interchange in West Globeville.



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FIGURE 27

LAND USES

Fire Protection Denver Fire Station Nine located in West Elyria serves the Swansea, Elyria and Globeville neighborhoods. This station would have to be acquired and relocated due to the impact of this project. See detailed discussion under Fire Station Nine, this section.

Local Bus Service Globeville is served by two RTD bus routes. One bus services Washington Street, the other Broadway/Lincoln and 45th Avenue. Elyria's one RTD bus route services Brighton Boulevard McFarland Drive at 44th Street and 47th Avenue.

Library None of the neighborhoods has a public library, but a 1989 Denver bond issue calls for a library to be built in Globeville, Elyria, Swansea, or the Chaffee Park neighborhood which is approximately one mile west of I-25. At the time of publication, no site had been chosen.

Arts and Theater East Elyria's Su Teatro is a local theater company which host plays and other events throughout the year. A private art center now resides in the former East Elyria library.

Schools Beginning with the 1992/93 school year, Central Globeville's Garden Place kindergarten through fifth grade public elementary school became an "academy" and attracts students from throughout Denver because of the academy's international baccalaureate program. Formerly, Garden Place only served early childhood elementary through the second grade and was considered for closure because of its under-utilization.

Central Globeville provides the campus setting for Laradon Hall and Laradon Industries which provide occupational training, a small product industry, and residency for mentally-handicapped people.

East Elyria had an elementary school which is now home to Su Teatro. Elyria students attend kindergarten through second grade at Swansea Elementary which is paired with a school in southeast Denver for grades three through five. Both Garden Place and Swansea students are bused to other Denver Public Schools (DPS) for middle and high schools.

School Buses East Elyria houses one of the Denver Public Schools bus terminals north of I-70 along Brighton Boulevard. Elyria residents questioned the impact of the terminal's 200 buses and their routes on the capacity needs at the proposed Brighton Boulevard interchange. The bus terminal primarily serves the DPS district to the east although a few buses go south or west. Most of the eastbound buses use the I-70 eastbound entrance ramp at Brighton Boulevard except for those with pick ups in Swansea. These buses use any of the ramps between Washington Street and Colorado Boulevard, depending upon their destination. The buses which primarily use the Brighton Boulevard entrance ramp sometimes divert to 46th Avenue to Vasquez Boulevard to avoid congestion on I-70.

Buses leave the Brighton Boulevard terminal periodically between 5:30 and 7:30 AM. Most of these buses are back by 9 AM. Some leave again at 11 AM, while other leave at 2 PM. Most all of the buses return between 4 and 5 PM and most all of these buses use the westbound exit ramp to Brighton Boulevard. After describing the major project elements to the terminal's management, the relocation of the 46th Avenue/Brighton Boulevard intersection would help the flow of bus traffic to the eastbound entrance ramp since access to this ramp sometimes gets blocked by 46th Avenue-bound traffic. Bus drivers now encounter a difficulty in seeing northbound Brighton Boulevard traffic from the left turn lane of southbound Brighton Boulevard to the eastbound ramp. The project element to lessen the severity of the curve at this ramp would alleviate this problem.

Neighborhood Serving Businesses Globeville supports a number of small businesses along 45th Avenue, Washington Street and to a lesser extent 51st Avenue. These businesses are primarily small convenience stores, liquor stores, and restaurants. Elyria supports businesses along Brighton Boulevard and 47th Avenue, and along 46th Avenue between York and Josephine Streets. These businesses are primarily small convenience stores, and restaurants. Residents from both neighborhoods travel to I-70 and Pecos Street or to Commerce City for groceries.

C. POPULATION

In 1990, the Bureau of Census reported the population in the Elyria/Swansea neighborhood to be 5,055 people. Seventy-three percent (73%) of the Elyria/Swansea people responding to the 1990 census identified themselves or family members as Hispanic. These statistic reflects a 4% reduction is population between 1980 and 1990 and an 8% increase in the Hispanic population.

In 1990, the Bureau of Census determined the population of Globeville to be 3,459 people with 68% of the population identified as Hispanic. These statistics reflect a 3% reduction in population with a 15% increase in Hispanic population between 1980 and 1990. In 1991, Stapleton Homes were vacated, which reduced Globeville's population by 548 people (16% reduction). The Stapleton population was estimated to be one-third each of Hispanic, black, and white with a high percentage of youths.

In comparing the census of 1980 and 1990, the City & County of Denver's population fell by 5%.

Approximately 35% (Elyria/Swansea) and 38% (Globeville) of the populations are 18 years old or younger, compared to a city average of 22% for the same age group. Approximately 11% (Elyria/Swansea) and 8% (Globeville) of the populations are 65 years old or older, compared to a city average of 14% for the same age group.

D. INCOME AND UNEMPLOYMENT

The median household income from 1989 statistics as determined by the 1990 U.S. Census for Elyria/Swansea was \$17,129, and \$16,977 for Globeville. Both income levels are below the citywide median of \$25,106. The U.S. and Colorado poverty level established by the 1990 census from 1989 statistics is \$9,885 for a family of three. The average number of persons per household in Globeville is 3.3 and 3.12 for Elyria/Swansea. Twenty-six of Denver's 137 census tracts report incomes lower than Elyria/Swansea and Globeville.

Per capita incomes for residents of both neighborhoods are approximately 40% less than the per capita incomes citywide. According to the 1990 census, the incomes of 30% of Elyria/Swansea's and 39% of the Globeville's residents were below the poverty level. Citywide, the incomes of 17% of Denver's residents were below the poverty level.

The unemployment statistics by neighborhood is from the 1990 census. The 1990 unemployment rates were 11% for Swansea/Elyria and 16.7% for Globeville (with Stapleton Homes operational), compared with the citywide average of 6.8%.

E. HOUSING

According to the 1990 census, Elyria/Swansea had 1,849 total housing units. Of the total units, 87% were occupied and 82% were single family units. Sixty-one percent (61%) of the occupied housing units were owner-occupied. The Swansea/Elyria neighborhood's total housing units peaked in 1960 with a total of 2123 housing units. With the construction of the I-70 viaduct and a change in land use due to other causes, the housing units dropped in 1970 to 1957 total units. The construction of the I-70 viaduct required the acquisition of nearly 50 residential properties. The expansion of NWSS over time has consumed what had been approximately 50 residential properties in West Elyria.

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Stapleton Homes public housing was located in Central Globeville until 1991 when its fifteen buildings (and 232 housing units) were demolished. According to the 1990 census, Globeville (including Stapleton Homes) had 1182 housing units. Of the total units, 86% were occupied and 83% were single family units. Fifty-four percent (54%) of the housing units were owner-occupied. Housing in Globeville peaked in 1950 with 1,547 housing units. Approximately 70 homes were lost to Central Globeville for the construction of the (then) I-25/46th Avenue interchange and I-70.

The citywide average for owner-occupancy of occupied units is 49%.

By 1992, the average age of single-family structures in Elyria is 60 years and 80 years in Globeville.

Swansea/Elyria Charrette Report

In June of 1989, the Denver Planning Office held a "charrette" with Swansea and Elyria residents and representatives of local businesses and industries to address the immediate issues facing the neighborhoods. The report addressed the entire Elyria and Swansea neighborhoods whereas this project primarily effects Elyria. The Swansea/Elyria Charrette Report was published in the Fall, 1989. The Denver Planning Office intends to follow this report with a neighborhood plan, but at the time of EA publication, no plan was available. See Table G for transportation issues.

Issues raised in the report which relate to this project include noted below. References are given to the sections of the EA where the issues are discussed.

**TABLE G
SWANSEA/ELYRIA CHARETTE REPORT**

| ISSUES | EA RESPONSE CHAPTER |
|---|---|
| 1. I-70's appearance; level of maintenance on I-70 rights-of-way; poor lighting and street scaping; 46th Avenue is dark & unfriendly, it has a tough industrial character, hostile to pedestrians; visual impact of I-70 on Swansea/Elyria. | Visual Impacts |
| 2. Lack of splash guards. | Visual Impacts |
| 3. Mitigate the impact of the I-70 viaduct by focusing neighborhood retail on it, making more of a 'setting' than a 'barrier'; create a "sense of place" strengthening the edges and establishing gateways. | Visual Impacts; Social/Economic |
| 4. Location site of Fire Station 9 | Social/Economic; Right-of-Way |
| 5. The adequacy of sidewalks, curbs & gutters and storm sewers. | Consideration Given to Pedestrians & Bicyclists; Water Quality |
| 6. Poor connections for pedestrians & vehicles between neighborhoods; poor pedestrian and bicycle networks. | Preferred Alternative; Consideration Given to Pedestrians & Bicyclists |

TABLE G cont'd
SWANSEA/ELYRIA CHARETTE REPORT

| ISSUES | EA RESPONSE CHAPTER |
|---|--------------------------|
| 7. Improve Brighton Boulevard to a four lane parkway arterial to facilitate access to the industrial area and discourage the need for shortcutting on local streets. | Preferred Alternative |
| 8. Design & construct an interchange at I-70/Brighton Boulevard and investigate possibly constructing I-70 from Colorado Boulevard to the mousetrap at grade. | Alternatives Considered |
| 9. Access to major highway systems makes the area attractive for highway oriented uses. Improved highway access will make the area even more attractive to such users. The residential development appears to be stable but the underlying concern is how the housing will be protected thus ensuring that stability. | Social/Economic |
| 10. Specific concern that emissions from motor vehicles are adversely affecting the health of the neighborhood (lead, CO, particulates, and toxics from diesel vehicles). | Air Quality |
| 11. Monitoring noise levels and develop mitigation measures as part of I-70 redevelopment. | Noise Impacts |
| 12. Move houses/buildings in expanded Brighton Boulevard interchange area to fill vacant pockets in the neighborhood. | Right-of-Way; Relocation |

A Globeville Neighborhood Plan was prepared in November 1988 and adopted by Denver City Council in February, 1989. See Table H for transportation issues relating to East Globeville.

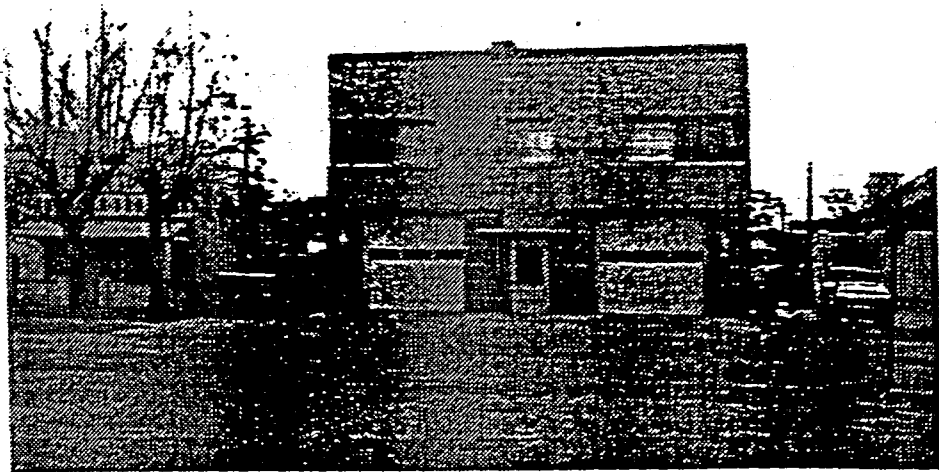
TABLE H
GLOBEVILLE NEIGHBORHOOD PLAN

| ISSUES | EA RESPONSE CHAPTER |
|--|---|
| 1. Retain the present level of highway access at Washington Street. | Preferred Alternative |
| 2. Improve traffic movements along Washington Street. | Preferred Alternative; Traffic Operations |
| 3. Create a positive visual appearance along Washington Street (sign type, lighting, and color); encourage the planting of trees along Washington Street; redesign landscaping treatment at the Washington St./I-70 Globeville gateway. New tree plantings, flower garden, and a "Welcome to Denver and Globeville" sign are recommended. Similarly, design new landscaping treatment on Washington St., at the north city limits. | Visual Impacts |
| 4. Develop at least two bikeway access points between East Globeville and the Platte River Greenway. 44th Avenue at the McDonald's Restaurant, the I-70/Washington Street interchange, the Colorado and Southern Railroad right-of-way, and 51st Avenue near the former sewage treatment plant are possible locations. | Consideration Given to Pedestrians & Bicyclists |

F. FIRE STATION NINE

Denver Fire Station Nine serves the Swansea, Elyria, and Globeville neighborhoods. Fire Station Nine was constructed in 1939 on the site of the former Company No. 9 station which was built in 1890 for the Elyria Fire Department. (See Historical Section for more information.) The existing station is located north of I-70, two blocks east of Brighton Boulevard, at 4600 Franklin Street.

Fire Station 9 would be impacted by this project. See the Right-of-Way Acquisition section regarding replacement details.



Fire Station Nine would have to be acquired and relocated at project expense due to the impact caused by the relocation of the I-70 westbound entrance ramp from the ramp's existing location at Humboldt Street to its new location at Brighton Boulevard.

The DFD has an established method for siting new fire stations. This method examines and gives appropriate weight to response time criteria, the average life cycle of a station, input from the station's firefighters, future changes in the city's demographics, and the locations of DFD's other existing and proposed fire stations.

Response time criteria addresses the ability of providing emergency services in an effective manner upon the arrival of adequate resources to an incident in a timely manner. The industry's standard and the DFD's minimum response time criteria for the arrival of medical personnel to an emergency is four minutes for 90% of the incidents and 6 minutes for 100% of the incidents. This standard is based upon the probability of how long a patient could survive a serious injury before receiving basic life support. Response time is based on four factors: incident detection, alarm and dispatch, travel time to the incident, and control of the incident. Other factors which could impact response time includes the time of day, traffic congestion, and natural and man-made barriers.

In considering sites for the location of fire stations, DFD's criteria also includes:

- Compatibility with zoning requirements;
- Accommodating minimum site requirements of approximately 23,000 to 30,000 sq. ft. for a 11,000 sq. ft. building;
- Access from the site to the north, south, east, and west to ensure multiple response routes;
- Proximity to a controlled intersection and main arteries to add flexibility in being able to choose appropriate response routes;

- Locating the station near the determined center-of-demand of expected incidents;
- The adequacy of street widths; and,
- Neighborhood acceptance.

After applying the methodology to select a site for the replacement of Fire Station Nine, the DFD concluded that the new station should be located south of I-70, between 38th and 43rd Avenues, on Brighton Boulevard. The DFD has identified that the center-of-demand is south of I-70. During 1991, the greatest number of responses made by Fire Station Nine occurred south of I-70, east of Brighton Boulevard although a total of the aggregate responses north and south of I-70 indicate that 51% of the responses occurred north of I-70 and 49% south. (See Figure 29.) DFD also supports relocating Fire Station Nine south of I-70 with the change in response areas created by the relocation of Fire Station Ten. Fire Station Ten is relocating 20 blocks east from 32nd Avenue and Curtis Street to 32nd Avenue and Steele Street. (Fire Station Ten is expected to be operating from the new location during the Summer or Fall of 1993.) (See Figure 28)

Siting the new Fire Station Nine would need to comply with DFD's selection methodology. CDOT is relying on the DFD to determine the site, and its compliance with the methodology. Numerous sites were considered as possible relocation sites. Sites along Washington Street were rejected due to the inability of accessing the I-70 flyovers from the Washington Street interchange and distance from the center of demand. A site at 38th and Arkins Court was rejected due to the unacceptable grade of 38th Street, minimum-sized lot, and constrictions at the Washington Street underpass. Sites near the new Brighton Boulevard interchange on property made available due to this project were rejected due to their proximity to the Interstate or minimum-sized lots. City-owned property at 47th and Vine was rejected due to poor accessibility to multiple response routes.

The DFD has selected two sites which meet the selection criteria. The sites are located along Brighton Boulevard at 38th Avenue and near 42nd Avenue. (See Right-of-Way Section for more details of the proposed sites.) The DFD has determined that locating the station at either of the two sites on Brighton Boulevard between 38th and 42nd Avenues would enable Fire Station Nine to service the Globeville, Elyria, and Swansea neighborhoods in compliance with the response time criteria but they prefer the site closer to 42nd Avenue.

The DFD projected a change in response time to three areas which would be most affected by the relocation of the fire department due to remoteness, accessibility or frequency of response. The table below indicates the calculated change in response. All areas would fall within the 6 minute response criteria although responses to the north Swansea area may exceed the 4 minute response goal for 90% of incidences. Due to the relocation of Fire Station Ten, the DFD may decide to dispatch Fire Station Ten to portions of Swansea due to this Station's closer proximity to the northern Swansea area.

CHANGE IN INCIDENT RESPONSE TIME

| Incident Location | Existing Station 9 | Proposed Site 8 | | Future Station 10 3200 Steele |
|-----------------------------------|---|------------------------|------------------------|----------------------------------|
| | | 3800 BB* | 4201 BB | |
| | Distance/Actual Time (mile)/(minute) | Distance/Time Δ | Distance/Time Δ | Distance/Time Δ |
| 5100 Lincoln (Laradon Hall) | 1.7/3.12 | 1.6/2.94 | 1.9/3.50 | NA |
| I-70A-25 | 1.0/2.54 | 1.2/3.05 | 1.3/3.30 | NA |
| 5305 Adams (private residence) | 1.9/3.55 | 2.5/5.15 | 2.2/4.53 | 2.1/4.33 |

* BB - Brighton Boulevard Δ - Calculated time based on actual average response time per mile.

FIRE STATION RELATED NEIGHBORHOOD AND CONSTRUCTION ISSUES

The Elyria neighborhood raised an issue regarding the impact to emergency response time due to construction activities. The DFD responded to the issue in this way: Adequate notice to DFD personnel about construction phases and activities would enable alternate response routes to be developed so that there would be no negative impact on response time due to construction activities. As changes occur, communications between the CDOT and the DFD's dispatch center advising of closed streets and/or the availability of alternate routes would be required. This information would be relayed to DFD's emergency response unit, therefore, keeping the fire crews current on the changing access throughout the response area. The DFD would also drive the project area regularly to keep current with construction activities.

The Elyria neighborhood also asked for assurance that the existing station would not be closed until the new station was fully operational. The DFD has notified CDOT of the identical concern.

The DFD recommended that CDOT should consider providing a street numbering system for emergency personnel, a crossover ramp between the eastbound to westbound lanes of I-70 and access from the viaduct to fire hydrant locations.

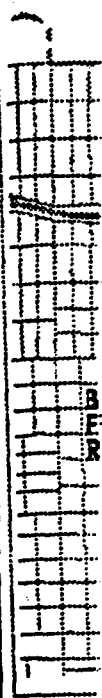
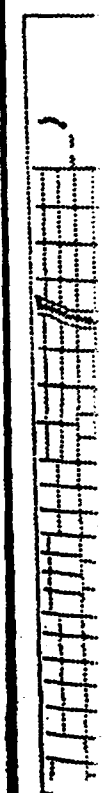
Impacts and Mitigation CDOT personnel would maintain close communication with DFD's dispatch center to comply with the direction noted above. In addition, traffic control measures to assist fire equipment through construction zones would be instituted as necessary and as identified by the DFD. A crossover ramp could not be constructed between the two directions of traffic since westbound and eastbound would be on two separate structures. The fire equipment would utilize the interchanges at Washington Street and Brighton Boulevard which are distanced .6 miles apart to access the opposite direction of travel, or utilize the 12' shoulder area and pass equipment over the median barrier to access the opposite direction of travel. CDOT would not take the existing station out of service until the new station is fully operational.

G. SOCIAL IMPACTS**Elyria**

The impacts to the social conditions of the neighborhoods would primarily be affected in a positive way. The mitigation commitments outlined in this EA in Visual Impacts, Consideration Given to Pedestrians and Bicyclists, Right-of-Way and Relocation, and Noise Impacts, in addition to local street improvements identified in the Preferred Alternative, would serve to enhance the surrounding environments.

These mitigation measures work in concert with the strong desire of the Elyria neighborhood to stabilize the residential core of East Elyria. The noise walls would provide a relief to the roadway noise and splash which now affects East Elyria. The relocation of 46th Avenue north of the I-70/Brighton Boulevard interchange would allow pedestrian and local commuters to pass between Globeville, Elyria, and Swansea and avoid the interchange traffic. Improving the visual appearance of I-70 with aesthetic considerations given to wall, pier, landscaping, and lighting design would "strengthen the edges" making I-70 more of a "setting than a barrier" as recommended in the Swansea/Elyria Charette.

The addition of a access ramp to the South Platte River between 46th and 47th Avenue would provide a long identified need for the Elyria and Swansea residents, and an alternative route for north Globeville residents. The local street improvements would aid the Globeville community's desire to attract new businesses to the area and relieve some of the Elyria neighborhood's traffic issues during major shows at the NWSS or the Denver Coliseum. This relief would be due to the "horseshoe configuration" of 46th/44th Street, and the NWSS's west bus loop's incorporated into the project's design. New business attractions and the expansion of the NWSS might provide employment opportunities for the neighborhood's poor and unemployed.

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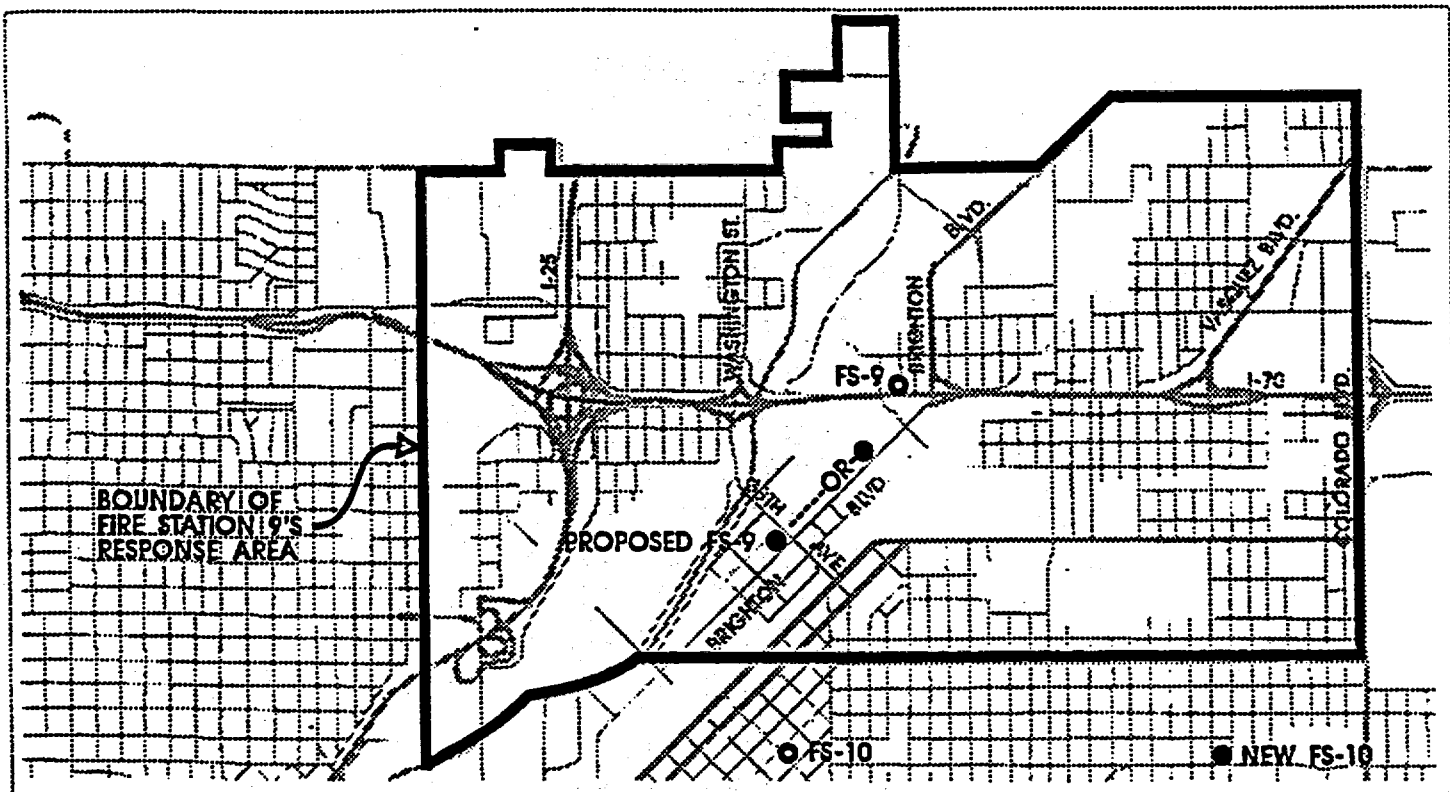


FIGURE 28
FIRE STATION 9 BOUNDARIES, EXISTING & FUTURE STATION SITES

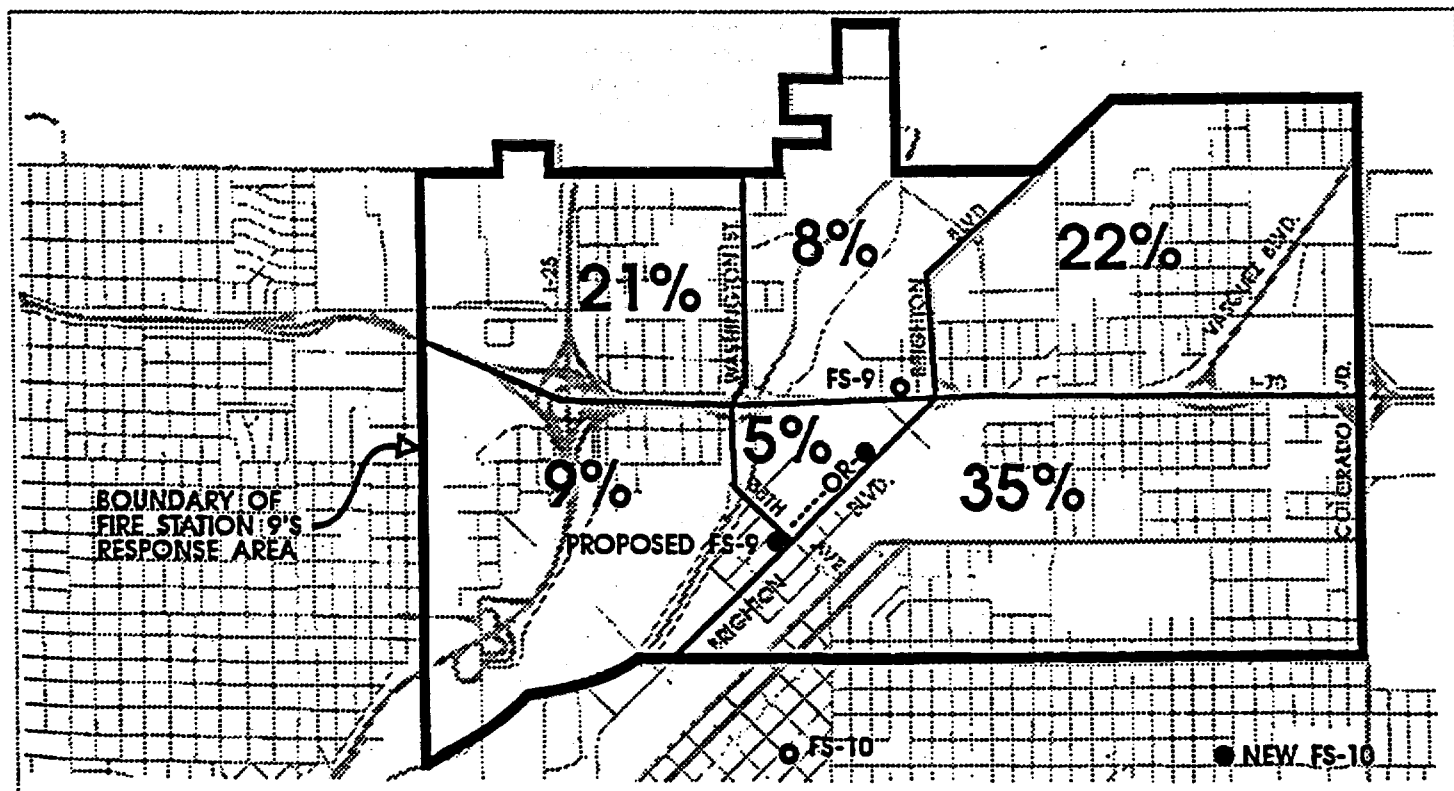


FIGURE 29
DISTRIBUTION OF EMERGENCY RESPONSES FOR FIRE STATION 9 DURING 1991

The social environment would also be positively affected due to the proposed project's responsibility to build the City and County of Denver a new fire station to replace Fire Station Nine. The 1939 two-bay fire station would be replaced with a three-bay fire station at Federal and State transportation funding expense. A larger, modernized station, appropriately located, staffed, and equipped, would enable the Denver Fire Department to better serve the Elyria, Swansea, and Globeville neighborhoods.

The construction of the preferred alternative, which would require the acquisition of an estimated 15 residential properties in West Elyria and one in East Elyria, would reduce Elyria's housing stock by about 5%, equalling about half of the remaining homes in West Elyria. The NWSS has announced its intention to acquire the remaining residential properties in West Elyria as money permits. The complexion of West Elyria would change permanently if the proposed acquisition of the residential properties for the project and the expansion plans of the NWSS occurred. The elimination of the residential land use in West Elyria would bring this area in compliance with current zoning.

The primary negative impact to the social environment might be the additional loss of Elyria residential stock. This loss may be viewed negatively by some of the residents of West Elyria impacted who would prefer to stay in their homes, or by some residents who are not identified for acquisition for this project and would remain until NWSS purchases their properties. Since the pre-I-70 viaduct period when West and East Elyria's housing stock totalled about 400 units, the total units have been reduced to under 300 due to the initial construction of I-70, expansion of the NWSS, housing deterioration, and the redevelopment of the Brighton Boulevard corridor to commercial uses. Approximately thirty-two houses and one business in West and East Elyria were acquired for the initial construction of the I-70 viaduct. However, the loss of the residential properties in West Elyria due to this proposed project would likely have occurred anyway, only due to the expansion of the NWSS.

The relatively high unemployment rate and below-average earnings in the Globeville, Swansea, and Elyria neighborhoods might be affected positively if this roadway improvement project spurs economic redevelopment, and if the new or revitalized businesses employ people from the neighborhoods. A roadway improvement project which improves access to and the local street system, which this project would, is one of the many factors which can contribute to economic redevelopment. The loss of the businesses due to the land acquisitions necessary for the proposed project would not substantially affect the employment base of Globeville, Swansea, or Elyria, since most of the businesses' employees live outside the area.

The social environment would be affected temporarily but negatively due to construction activities. See mitigation measures under Construction Activities. Also see discussion under Secondary and Cumulative Impacts.

H. MITIGATION FOR SOCIAL IMPACTS

See mitigation discussions under Visual Impacts, Consideration Given to Pedestrians and Bicyclists, Right-of-Way and Relocation, Noise Impacts, Preferred Alternative, Construction Impacts, and Impacts and Mitigation for Fire Station Nine, this chapter.

3.5 AIR QUALITY

The Clean Air Act Amendments of 1990 require states to demonstrate conformity between transportation plans, programs, and projects and a state's air quality State Implementation Plan (SIP). A SIP may contain transportation control measures which are intended to reduce pollutant levels in order to attain federal air quality standards.

A. AFFECTED ENVIRONMENT

Carbon Monoxide The Environmental Protection Agency has designated the Denver region as a non-attainment area for carbon monoxide (CO) air quality standards. CO standards have been established due to the effect of CO on the central nervous system since CO at certain concentrations can deprive the body of oxygen. CO levels in the Denver metropolitan area have been falling steadily since 1980. The federal eight-hour standard for CO (9.0 ppm) was exceeded on four days in 1990, and six days in 1989. The highest monitored eight-hour average CO concentration was 12.1 ppm in 1990 and 11.5 ppm in 1989.

Ozone is regulated since exposure to it at various levels may impair mechanical functions of the lung and may induce respiratory and related symptoms in sensitive individuals. Denver is also classified as marginally nonattainment for ozone although no violations of the ozone standard have occurred in Denver since 1986.

PM10 Denver is also designated a moderate non-attainment area for particulates (PM-10). PM10 standards have been established due to deeper inhale-ability of smaller particles deeper into the lungs than particulates of larger sizes, and the health risks associated with such inhalation. No violations of PM-10 have been monitored in metropolitan Denver since 1987. (Preliminary monitoring data for December 1992 indicated that a PM-10 violation may have occurred in early December. ADCP has not yet officially certified the monitoring data.)

Lead is a monitored pollutant. It is regulated due to its apparent ability to be absorbed into the blood stream through absorption into the gastro-intestinal tract. There have been no exceedences in Lead primarily due to the increased use of unleaded gasoline in catalyst-equipped cars and the mandated reduction of lead content in leaded gasolines. Some Elyria residents raised a concern about their exposure to high lead levels due to the neighborhood's proximity to I-70. The Colorado Air Pollution Control Division conducted a special air monitoring in 1990 at Globeville's Garden Place Academy and at the Swansea Elementary School. See Table O for 1990 data which indicates that lead levels measured at these sites were within standards.

Attainment Requirements Under the Clean Air Act Amendments of 1990, Denver must attain federal carbon monoxide standards by December 31, 1995, and PM10 standards by December 31, 1994 at the risk of possibly jeopardizing the use of federal transportation funds in non-attainment areas.

Air Monitoring Stations As part of the metropolitan area-wide air quality monitoring program, the Colorado Air Pollution Control Division maintains a permanent monitoring station in downtown Denver which is approximately two miles south of the project area. Although there are no air monitoring sites in the project area, the project area would be expected to experience similar pollution levels to those of downtown Denver due to the project's proximity to the South Platte River valley which also passes through the downtown area. River valleys tend to "carry" pollution in the direction of the river's flow. The flow of the river is from south to north.

| TABLE 0 LEAD (Pb) 1990 DATA SUMMARY (micrograms per cubic meter) STANDARD = 1.5 ug/m | | | | |
|--|-------------------|--------------------|---------------------|-------------------|
| MAXIMUM QUARTERLY VALUES | | | | |
| LOCATION | QTR. 1 JAN-MAR | QTR. 2 APR-JUNE | QTR. 3 JULY-SEPT | QTR. 4 OCT-DEC |
| Garden Place School, 4425 N. Lincoln | 0.07 | 0.06 | 0.06 | 0.09 |
| Globeville Community Health Center, 5400 N. Lincoln | 0.05 | 0.06 | 0.07 | 0.11 |
| Clinicare | 0.07 | 0.09 | 0.14 | 0.20 |

Source: Colorado Air Quality Data Report (CDH, Air Pollution Control Division, 1990, page 68.)

B. PM10 ATTAINMENT MEASURES

Due to the concern the Elyria residents raised about the dusty environment in the project area, the following information is provided to inform the residents of actions which are or may be taken to comply with federal attainment requirements.

The Regional Air Quality Council (RAQC) is responsible for selecting any transportation measures needed to aid in achieving the PM10 federal air quality standard. The RAQC has examined numerous transportation measures to reduce vehicular travel and to change street sanding procedures which combined are suspected to be the largest contributors to PM10.

The excerpts below are from: *Transportation Measures to Reduce Vehicular Travel* (DRCOG, October, 1991)

In 1987, the U.S. EPA promulgated PM10 standards of 150 micrograms per cubic meter as a 24-hour average. While the Denver region has not violated the PM10 standard since December 1987, the area is currently classified as a moderate non-attainment area. SIP development must demonstrate attainment of the standards by December 31, 1994.

PM10 is generated by mobile sources as well as non-mobile sources which include (1) stationary sources such as power plants, (2) wood burning, and (3) geological or agricultural sources. Estimates of how much mobile sources contribute to the overall PM10 problem vary greatly. The estimates available do indicate that mobile sources appear to be a significant

contributor to the PM10 problem in the Denver area. For example, the RAQC developed a rough 1995 source apportionment which estimated that re-entrained dust from roadways contributes about 35 percent of the PM10 problem and that vehicle exhaust emissions contributes about 11 percent of the PM10 problem.

While re-entrained dust is the largest mobile source contributor to PM10, little is known of the source of the dust on the roadways or of the factors which influence the re-entrainment of this dust. Roadway dust can result from many factors, including street sanding, mud and dirt carry out, pavement wear, the breakdown of litter and biological material, atmospheric fallout and other sources. The contribution of each of these sources to the overall dust problem is unknown. (See discussion regarding street sanding, this section.)

Primary PM10 emissions from diesel fuel vehicles are estimated to be ten times higher than from comparable gasoline fuel vehicles. The brown cloud study analysis of vehicle registration, fuel sales and vehicles miles traveled indicates that approximately half of the primary emissions from motor vehicles can be attributed to diesel engine emissions (1987-88 Brown Cloud Study, page 59). The 1990 Clean Air Act amendments should significantly reduce emissions from diesel fuel vehicles and lessen the proportion of the direct emissions which come from this source.

The RACQ identified certain "promising measures" which might be implemented if necessary in order to reduce the amount of vehicular travel to meet attainment. At the time of this EA's publication, the RACQ had not determined if any or which transportation control measures may need to be implemented to reach attainment. These RACQ promising measures are not a mitigation commitment of this project.

Promising Measures for Decreasing VMT and Vehicular Travel

Demand Measures

1. Carpooling (Rideshare Matching/Promote Carpooling/Preferential Parking/Employer Subsidy)
2. Parking Management/Parking Cost Increase
3. Auto Operating Cost (Gas Tax Increase/Increased Auto Registration Fee Based on VMT/Tolls or Road User Fees)
4. Trip Reduction Program
5. Four-Day Work Week/Telecommuting
6. Mandatory No-Drive Day
7. Reduce Transit Fares

Supply Measures

8. Increase Transit Frequency
9. HOV Lanes
10. Rapid Transit

STREET SANDING

CDOT participated with RACQ in the establishment of street sanding guidelines. The follow excerpts are from: Guidelines to Reduce Air Pollution From Street Sanding (RAQC, September, 1991). CDOT is complying with the guidelines which are summarized below:

During the winter months, sand and salt are used on roads throughout Colorado to minimize the risk of accidents that threaten the safety of the motoring public. Unfortunately, this same practice has a negative impact on human health and the quality of life along the Front Range when it results in air pollution by fine particulate matter. Winter is the season when air pollution along the Front Range is at its worst, and reentrained dust from paved roads is a significant part of the problem. Reentrained road dust not only contributes to the Brown Cloud, but also threatens human health when levels of fine particulate matter go above the federal health-based air quality standard for this pollutant.

While street sanding must continue in order to ensure public safety, there are things that can be done to reduce the negative impacts on human health and the environment. A group of public work officials and industry representatives prepared guidelines to reduce sanding. By following these guidelines, public works departments can reduce the amount of air pollution from street sanding without sacrificing public safety. The guidelines were approved by the Regional Air Quality Council at their September 19, 1991 meeting.

The public works officials established air quality as their top priority, but there are other good reasons to follow these guidelines. Reducing the amount of sand and salt applied to roadways will: 1) save local governments money on sanding and sweeping; 2) minimize deterioration of bridges and roadway surfaces; 3) cut down on cracked windshields and chipped paint; 4) reduce water pollution from storm water discharges; and 5) decrease the amount of used street sand that has to be put in a landfill.

Street sanding procedures and operations are the responsibility of CDOT highway maintenance personnel and local government street maintenance departments. The sanding and cleaning procedures described within are not a mitigation commitment of this project.

STREET SANDING GUIDELINES

1. Sand only where needed.
2. Investigate requests for sand to assure that sanding is warranted.
3. Minimize the quantity of sand applied:
The target of 500 pounds per lane mile should apply most of the time, although there may be some variation based on the type of roadway being sanded. During 1991 sanding operations, CDOT reduced the application of sand and salt to 300 pounds per lane mile.
4. Use snowplows before sanding or in lieu of sanding (for some conditions).
5. Properly calibrate and maintain spreaders to reduce the quantity of sand applied.
6. Purchase better spreaders capable of achieving accurate spreading rates.
7. Early application of deicers.
8. Limit the use of rock salt because it contributes to the air pollution associated with street sanding.
9. Use alternative deicing compounds which melt ice at lower temperatures and which are less corrosive than rock salt.
10. Utilize weather information systems:
Ice sensors are located at the I-70/I-25 interchange and on I-70 near Vasquez Boulevard. The weather information system currently being used by the Colorado Department of Transportation and some local governments in the Denver metro area can be used by other public works officials to make better decisions on the need for sanding their roadways. These sensors provide forecast information on pavement temperature, air temperature, precipitation, wind direction, and wind speed to computers to help CDOT make better decisions about when and when no to sand the streets.
11. Training for operators.

STREET CLEANING GUIDELINES

Whereas the guidelines for street sanding described above will usually result in cost savings, that is not the case for some of the street cleaning guidelines described below. Improving air quality by improving street cleaning will generally require an increase in the amount of resources dedicated to street cleaning activities. Increasing the frequency of street cleaning will require additional staff time and may require the purchase of additional equipment.

12. Maintain sweeping equipment.
13. Increase the frequency of street sweeping as soon as possible after each storm.

C. AIR QUALITY IMPACTS

The Colorado Department of Transportation (CDOT) has coordinated this project with the Air Pollution Control Division (APCD) of the Colorado Department of Health. CDOT and APCD agreed that an intersection hot spot analysis should be conducted to determine the localized air quality impacts of this project.

CDOT calculated a worst-case eight-hour average carbon monoxide concentration of 8.3 ppm (federal standard - 9.0 ppm) for the build alternative. 1997 traffic volumes were used as an "opening-date" traffic projection to determine the impact on air quality following completion of the project.

Pursuant to section 176(c)(1)(B) of the 1990 Clean Air Act Amendments, this project "...will not (i) cause or contribute to any new violation of any standard in any area; (ii) increase the frequency or severity of any existing violation of any standard in any area; or (iii) delay timely attainment of any standard or any required interim emission reductions or other milestones in any area."

This project is included in the 2010 Denver Regional Transportation Plan. The Denver Regional Council of Governments (DRCOG) and the Federal Highway Administration (FHWA) have determined that the Regional Transportation Plan complies with the conformity provision of the 1990 Clean Air Act Amendments. The construction phase of this project is not included in the conforming 1993-1995 Transportation Improvement Program (TIP). Construction would not begin within the timeframe of the current TIP. This project would be included in a future conforming TIP before FHWA can approve federal funds for construction.

CDOT has determined that the project satisfies the applicable conformity provisions of the 1990 Clean Air Act Amendments. APCD has concurred with this determination. (See coordination/concurrence letter in Appendix.)

3.6 NOISE IMPACTS

A. METHODOLOGY

Federal Highway Administration (FHWA) noise regulations (23 CFR Part 772) state that traffic noise impacts occur when the predicted traffic noise levels approach or exceed the criteria for consideration of noise abatement (shown in Table P). FHWA's noise abatement criterion for exterior residential areas is 67 decibels.

If a noise impact is identified, noise abatement measures must be considered. The Federal regulations also state that "Federal funds may be used for noise abatement measures where the overall noise abatement benefits are determined to outweigh the overall adverse social, economic, and environmental effects and the costs of the noise abatement measures." CDOT's application of these regulations to previous federally-funded projects has led to the conclusion that, when balancing desirable and achievable results, full mitigation to FHWA's noise abatement criteria is not always cost-effective on a dollar per decibel per receiver basis.

The noise level ranges for the sensitive receptors identified below were predicted by the FHWA's computerized noise model based on current design information. A final noise analysis would be done during the final design phase of this project. However, the technical recommendation discussed below would not likely be changed by future refinement of the present highway design. Final noise barrier heights would be based on final design data, an analysis of the cost effectiveness of various types of walls, and any other reasonable considerations requested by the public during the review of the EA and the CAC process (see Section 3.13). The final noise analysis would determine exactly where noise barriers would be built.

B. EXISTING CONDITIONS

The project area is almost completely developed with a mix of industrial, commercial, and residential land uses which fall within activity groups B, C, and E as described in Table P. Figure 27 illustrates the boundaries of these uses which are more fully described in Chapter 3.2. The noise sensitive land uses which would be exposed to perceptible noise level increases by the proposed project are the residential uses in Globeville, and West and East Elyria.

Noise walls were constructed in 1991 for the homes north and south of I-70 in the Globeville neighborhood as part of the mousetrap reconstruction project. Only short segments remain to be completed once I-70 is widened immediately west of Washington Street.

Residential uses in Elyria are confined to areas north of I-70. Commercial/industrial uses occupy areas to the south. The Elyria neighborhood is not shielded from roadway noise from the elevated section of I-70 or from 46th Avenue underneath I-70. Reverberation of traffic noise via a series of echoes between the pavement of 46th Avenue and the underside of the I-70 viaduct raises peak hour noise levels an estimated 2-3 decibels. Most significantly, the reverberation intensifies the nuisance impact of single noise events such as single vehicular passings or backfires during sleeping hours.

Due to existing noise levels, CDOT has previously found the residential area eligible for its future consideration of eventual funding of retrofitted noise walls (see the discussion in the Secondary and Cumulative Impacts section).

Predicted existing peak hour noise levels at the sensitive receptors in both East and West Elyria nearest I-70 are in the range of 62-72 decibels. This range was determined using STAMINA2.0/OPTIMA, the most current computerized version of the FHWA's noise prediction model.

TABLE P
NOISE ABATEMENT CRITERIA
HOURLY AVERAGE SOUND LEVEL IN DECIBELS (dB)

| ACTIVITY GROUP | NOISE ABATEMENT CRITERIA $L_{eq(t)}$ * | DESCRIPTION OF ACTIVITY GROUP |
|----------------|--|---|
| A | 57 dB (exterior) | Tracts of lands in which the serenity and quiet extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose. Such areas could include amphitheaters, particular parks or portions of parks, or open spaces which are dedicated or recognized by appropriate local officials for activities requiring special qualities of serenity and quiet. |
| B | 67 dB (exterior) | Residences, motels, schools, churches, libraries, hospitals, picnic areas, play grounds, active sports areas, and parks. |
| C | 72 dB (exterior) | Developed lands, properties or activities not included in categories A and B above. |
| D | -- dB | Noise abatement measures are not required for lands which are undeveloped on the date of public knowledge of the proposed highway project. |
| E | 52 dB-(interior) | Indoor activities for the following facilities where no exterior noise sensitive land use or activity is identified. Residences, motels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums. |

* $L_{eq(t)}$ is the equivalent steady - state sound level which, in a stated period of time (in this case, one hour), contains the same amount of acoustical energy as the time - varying sound level during the same period.

No existing noise levels were calculated for Globeville since completion of the noise walls there is required to satisfy a commitment from a previous widening project.

C. FUTURE CONDITIONS

The land use of West Elyria is changing due to the current redevelopment of the NWSS. NWSS over time as funds allow has been acquiring properties between Brighton Boulevard and Humboldt Street for future site development. NWSS officials have announced their intention to acquire the remaining residential properties that would not be acquired by this project.

The residential uses in East Elyria and Globeville are stable and are supported by a strong contingent of homeowners who actively work to maintain and strengthen the residential qualities of the neighborhoods (see Table G, which lists the residents' issues of concern).

The existing reverberative noise problem in East and West Elyria would be improved by the proposed project because 46th Avenue would be relocated from beneath I-70 so that two reflective surfaces would not oppose each other. Only a short (approximately 200 foot) segment of 46th Avenue would remain beneath I-70 at the east end of the project area, where the reverberation would still occur.

D. PROPOSED MITIGATION

Globeville:

As part of the proposed project, the three parallel noise walls along I-70 would be completed from their existing endpoints east to Washington Street (see Figure 32), to complete the noise mitigation package for Globeville. The wall along the center of I-70 would end at the west edge of the rebuilt Washington bridge. Both walls outside of the collector/distributor roads would end near the curblane of Washington Street to adequately shield the nearby homes. To match the existing walls, all three walls would be of the same type (post-and-panel) and materials (concrete for the side walls, and absorptive Durisol[®] for the center wall).

NOISE WALLS

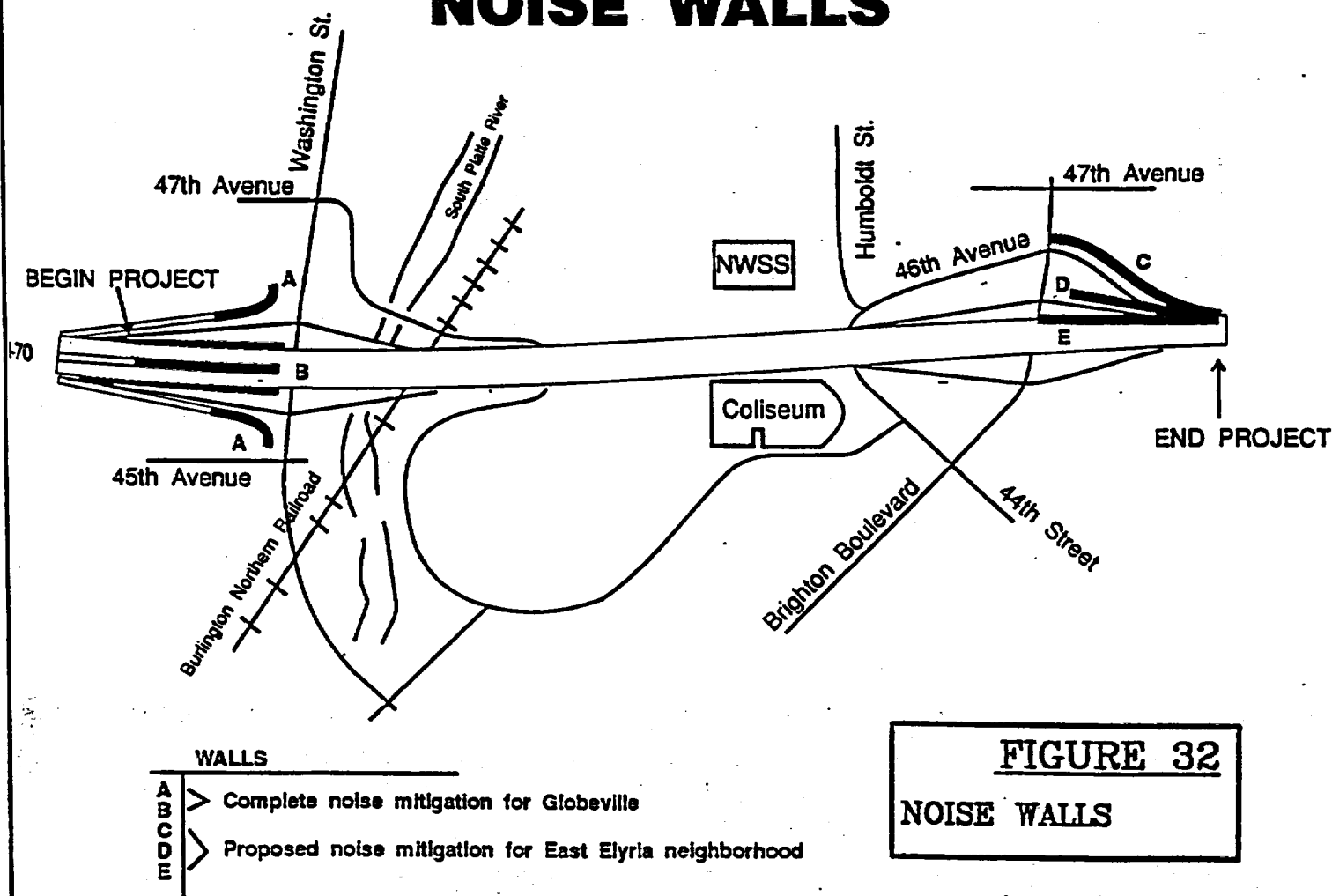


FIGURE 32
NOISE WALLS

East Elyria:

Three parallel noise walls are recommended to reduce vehicular noise levels at the homes in East Elyria. As shown in Figure 32, the following walls are proposed for construction with the proposed project: (1) a 12-foot tall wall extending along the realigned segment of 46th Avenue from Brighton Boulevard east to where 46th goes below grade (near Race Street); (2) a 6-foot tall wall extending west along I-70 from a point opposite Race Street to a point halfway down the new exit ramp to Brighton Boulevard; and (3) and a 5.5-foot total height wall along I-70 from the gore point of that ramp to the east edge of the Brighton Boulevard bridge.

The noise levels that would result from the proposed wall heights appear in the noise summary table (Table Q). These lengths and heights of wall are recommended as the optimally cost-effective noise mitigation package as determined by a series of several computerized noise prediction trials. The average amount of reduction for the first three rows of homes would be about four decibels, an perceptible difference from either future build or no build conditions.

The exorbitant cost of adding any type of wall taller than four feet to the 1.5 foot tall parapet wall of the existing I-70 guardrail precludes further consideration of a taller wall, which would be the only means of full mitigation to FHWA's exterior residential noise abatement criterion of 67 decibels. Construction of a different type of guardrail which could support a taller or a concrete wall would require extensive structural retrofitting of the existing viaduct. Reconstruction of this magnitude would be contrary to this project's parameter of minimizing reconstruction of the bridge structure east of Brighton Boulevard so as not to preclude future options for the redesign of I-70.

Preliminary estimates are that the proposed walls would cost 16% more than the maximum cost per decibel reduction normally recommended for noise walls. Therefore, CDOT's choice of wall type and material for the Elyria walls would be limited to those which could be attached to the viaduct's existing rail without extensive retrofitting or impact on the rail or structure, and those which are durable but least costly. No noise wall segments would be constructed of wood because of the higher maintenance costs and shorter life span of wooden walls. Currently CDOT's most cost effective masonry wall is constructed of colored concrete blocks with variable surface textures. This wall type would likely be the cost effective choice for the wall along 46th Avenue. Choices for the barrier along existing I-70 may be limited due to weight, installation, and performance characteristics. Barriers which use recycled materials are under consideration. The CAC would be involved in the determination of the wall types for 46th Avenue.

It is noteworthy that Elyria may realize lower noise levels than those predicted in the summary table. A current CDOT research effort to calibrate the FHWA noise prediction model to field measurements along Colorado highways is anticipated to reduce the model's predicted noise levels (as it has in other states that have conducted such research). If research results are as expected, lower predicted noise levels would mean that the real future Elyria levels would be near or below FHWA's 67 decibel criterion for noise abatement with the proposed noise walls.

TABLE Q

I-70/Brighton Boulevard
Noise Summary

| Neighborhood | Existing Decibel Levels | Future Decibel Levels (no walls) | Future Decibel Levels With Walls | Recommended Barrier Heights |
|--|-------------------------------|---|--|---|
| <u>West Elyria:</u> Humboldt Street to Brighton Blvd from I-70 to 47th Avenue* (10 homes) + | 62-72 dB | 64-76 dB | 64-75 dB | 3' traffic barriers on I-70 and entrance ramp to I-70; no wall along 46th Avenue. |
| <u>East Elyria:</u> Brighton Blvd to Vine Street, I-70 to 47th Avenue* (44 homes) | 62-72 dB | 64-76 dB | 63-72 dB | 5.5' traffic/noise barrier on I- 70, 6' traffic/noise barrier on exit ramp to I-70; 12' wall on 46th Avenue. |

+ Mitigations for these homes is not recommended. See text for details.

* Residents to the north of 47th Avenue would not be impacted by the proposed project.

West Elyria:

No noise walls other than the 3' tall traffic barriers are recommended to shield the remaining residential properties in West Elyria. This recommendation is based upon the following considerations:

1. The NWSS has announced its intentions to acquire all remaining residential properties in West Elyria that are not expected to be acquired by CDOT for this project. The City and County of Denver is exploring opportunities to assist in the relocation of these remaining residents.
2. A wall along realigned 46th Avenue would be rendered acoustically ineffective by access requirements to Franklin Street, Baldwin Court and the alleys in between them because any noise wall must be continuous to be effective. If wall segments with street gaps between them were built, only three of the homes that would remain (after the proposed relocation of the ramp and 46th Avenue) would benefit from a perceivable amount of noise reduction. This small degree of noise reduction would not justify the cost of the three parallel walls that were acoustically tested for West Elyria. East Elyria would not have the same access requirements to 46th Avenue, and also would have many times the number of homes shielded.

Construction Noise

Regarding construction noise, construction operations for this project would not be limited to nighttime hours by CDOT's contract specifications. Contractors would be required to have all of their machinery properly equipped with noise control devices that are maintained in good working order. Activities that generate excessive noise levels, as determined by resident complaint and local ordinances, would be restricted by CDOT's Project Engineer.

3.7 WATER ISSUES

The South Platte River is the only major drainage feature within the project limits. The 100-year flow in the project area overtops the west bank of the South Platte River. All drainage basins west of about Franklin Street drain directly into the South Platte River by means of street flow and storm drainage systems. East of Franklin Street, the drainage basins flow by way of street flow and storm drainage systems to the South Swansea storm sewer which crosses 46th Avenue to York Street.

The storm drainage system for existing I-70, 46th Avenue, and neighboring basins consists of two-24" trunklines along the north and south sides of 46th Avenue. These trunklines merge and outfall to the river just north of 46th Avenue bridge over the South Platte River. During major storm events, excess runoff from existing I-70, 46th Avenue, and neighboring basins collects in the BNRR underpass at 46th Avenue. A wet well and pump station located south of National Western Drive pumps the water collected in the underpass to the South Platte River. (See Figure 33)

Floodplain Issues

Solutions to reduce the impact of flooding along the South Platte River between the upstream limit of 38th Avenue to the downstream limit of 64th Avenue were explored in a study commissioned by the Urban Drainage and Flood Control District (South Platte River, Globeville and North Areas, by Hydro-Triad, November, 1991).

This study recommended that in the area of this proposed project, that a short flood levee wall be constructed at the top of the west bank beneath I-70 to confine flood waters to the river channel. This wall would be constructed as part of the proposed project.

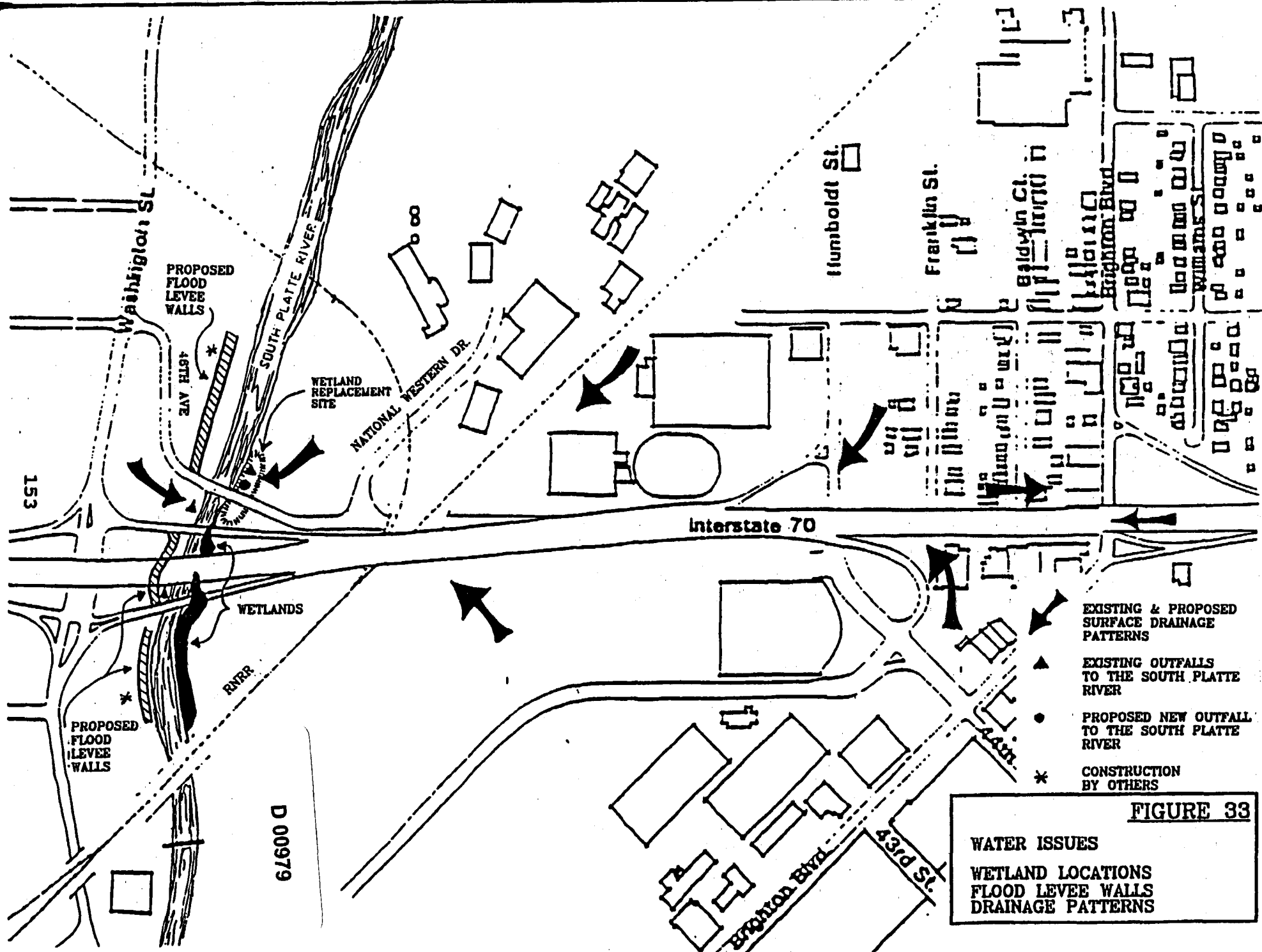
Other flood levee walls are recommended in the area of the proposed access ramp to the Greenway Trail and near the eastbound entrance-ramp from Washington Street. The proposed project may construct portions of these walls although cost sharing arrangements may need to be negotiated with responsible entities. The flood levee wall recommended at the site of the proposed access ramp may preclude the construction of the ramp at that location. See the discussion under Consideration Given to Bicyclists and Pedestrians about an alternative ramp location.

The study also recommended that a pocket park be constructed beneath I-70 in the area of the flood levee wall. See Visual Impacts, Landscaping discussion.

Hydraulic Issues

Overall historic drainage patterns would not be altered due to this project. The South Platte River would continue to serve as the ultimate outfall for runoff generated from the existing and proposed drainage basins. However, any additional I-70 drainage generated between Franklin Street and Brighton Boulevard above existing flow capacities would be directed to the South Platte River to avoid upsizing to the South Swansea storm sewer system. Drainage generated from the Washington Street area would be conveyed to existing storm sewer systems to the South Platte River.

The existing storm drainage system which parallels 46th Avenue accommodates a 2-year storm event. It would continue to accept the storm runoff from new 46th Avenue and neighboring basins as a result of this project. Storm runoff for proposed I-70 would be conveyed in a new self-contained system to the South Platte River. In compliance with federal, state, and local drainage design criteria, the new storm drainage system for I-70 would be sized to accommodate 5-year storm events. Flows from major storms in excess of the capacities of the 5-year storm drainage system for I-70, and the 2-year



storm drainage system for 46th Avenue and neighboring basins, would continue to collect at the 46th Avenue BNRR underpass where the water would be pumped to the South Platte River.

The collection of water at the BNRR underpass sometimes causes the underpass to be flooded. The impact to this underpass during major storm events with the completion of the proposed project should alleviate much of the flooding condition (depending upon flows) since the capacity of the storm drainage system for proposed I-70 would accommodate greater flows (5-year storm events) from the existing system's accommodation of 2-year storm events. Also, the existing system at the completion of the project would no longer need to accommodate drainage from I-70, and would primarily be utilized to accept drainage from 46th Avenue and neighboring basins.

MITIGATION

In addition to the new storm water systems and flood levee protection noted above, the following measures would be expected to be required for this project:

- Army Corp of Engineer's (ACOE) 404 Permit - This permit would be required for discharge of fill material (soil, riprap, concrete) below the ordinary high water elevation associated with the construction of I-70 over the South Platte River. Preliminary bridge plans should be reviewed with an ACOE representative to determine if a Nationwide, CDOT general, or an individual permit process would be required. Section 401, State of Colorado Water Quality Permit can also be issued with the 404 Permit application. See the Consideration Given to Bicyclists and Pedestrians regarding the Greenway Trail and Impacts to the South Platte River.
- SB40 - For CDOT clearance with the Colorado Division of Wildlife (see discussion under Chapter 3.9 - Ecology).
- National Pollution Discharge Elimination System (NPDES) Permit - This permit would be required from the Colorado Department of Health prior to construction. This permit would require that construction and post-construction activities incorporate best management practices to control erosion and storm water pollutants from entering the South Platte River. In conjunction with a NPDES permit, CDOT may explore opportunities to provide sedimentation or holding ponds within the project to facilitate sediment control. The north loop of the 46th Avenue "horseshoe" may provide an opportunity to combine landscaping or the outfall to the Platte would be designed with Sediment Control (see Wetland Discussion).
- Colorado Discharge Permit System (CDPS) General Permit may be required for construction dewatering. The CDPS program is administered through the Colorado Department of Health and complies with provisions of the Colorado Water Quality Control Act and Section 402 of the Clean Water Act. See Chapter 3.12 Hazardous Waste Section for comments regarding ground water quality.
- Adherence to all Federal Emergency Management Agency requirements.
- Conformance of all hydraulic designs to the requirements of 23 CFR 650.
- Adherence to local and CDOT drainage criteria in the design of both major and minor structures.

3.8 WETLAND FINDING

This Wetland Assessment and Finding is presented in compliance with Executive Order 11990, "Protection of Wetlands" and is in accordance with 23 CFR 771, 777 and Technical Advisory T6640.8A.

A. DESCRIPTION OF WETLANDS

Wetlands were identified along the South Platte River, within the proposed project corridor, during a fall survey in 1990. (See Figure 33.) The wetlands are located on the shoreline and a vegetated point bar along the eastern riverbank and occupy approximately 0.25 acres within proposed project limits. Wetlands present on-site are predominantly emergent and shrub/scrub, palustrine and persistent as described by the U.S. Fish and Wildlife Service (Cowardin et al. 1979). Delineation of the onsite wetlands was performed as described in the Federal Manual for Identifying and Delineating Jurisdictional Wetlands (1989).

Wetlands located on the riverbank proper, the northernmost segment shown on Figure 33, are dominated by the obligate species sandbar willow (*Salix exigua*, an obligate wetland species) and lady's thumb polygonum (*Polygonum persicaria*, an obligate wetland species). The point bar or southernmost wetland segment is dominated primarily by reed canarygrass (*Phalaris arundinacea*, a facultative wetland species), and small amounts of sandbar willow. The wetland margins generally supported the weedy species barnyard grass (*Echinochloa crus-galli*, a facultative wetland species) and cocklebur (*Xanthium strumarium*, a facultative species). Along the eastern wetland margin, a small pond covered with duckweed (*Lemna minor*, an obligate wetland species), was also present.

Higher elevations within the floodplain support a narrow band of riparian habitat, consisting of plains cottonwood (*Populus deltoides*) and peach-leaf willow (*Salix amygdaloides*) along the eastern embankment and elm (*Ulmus* sp.) growing out of riprap along the western embankment. The common understory species of the riparian habitat is smooth brome grass (*Bromopsis inermis*).

Wetland soils at this site consist of saturated sands and gravels that are dark yellowish brown. Debris present on wetland plants and trees indicates that these areas are inundated during high runoff events. Hydrology supporting wetland growth at this location includes periodic inundation during high flows, a relatively high groundwater table associated with the South Platte River, and seepage entering the site from the eastern embankment.

Important wetland functions include streambank protection, flood flow desynchronization, and ground water recharge and discharge, maintaining downstream water quality in the process. In addition, the wetlands provide important wildlife habitat, and have aesthetic appeal to people walking and riding on the nearby Greenway Trail.

The project area was re-surveyed during the late summer of 1992 and the delineation of wetlands had not changed since the fall 1990 survey.

B. WETLAND IMPACTS AND MITIGATION

Impacts

Currently, wetlands associated with the I-70 structures receive minor impacts due to maintenance activities. The maintenance impact is limited to clearing drainage ditches to improve runoff from the highway.

Until recently, beaver in the area were responsible for the loss of several cottonwood trees. It appears that beaver are no longer active at this site. Some shading effects from the existing structures were noted, however, the structures are sufficiently high that this impact is minimal.

Widening of I-70 would result in the direct loss of approximately 0.04 acres of wetlands. Most of this loss, approximately 0.03 acres, would occur over the long term due to shading from wider mainstream structures of I-70. Temporary impacts to about 0.13 acres of the wetlands would result from activities required to remove the existing piers and bridge structure, and the placement of new piers.

During construction, minor sedimentation to the South Platte River resulting from erosion of temporary fill and dewatering activities is also expected. Although this would be controlled with best management practices as required with a construction NPDES permit (see Water Issues).

Alternatives

A number of alternatives, including alternate alignments of I-70 and the "no-build" alternative, were considered. The no-build alternative was rejected, however, since the existing I-70 viaduct contains many undesirable conditions (see the Project Need).

The preferred alternative replaces I-70 on a modified alignment and results in wetland impacts comparable to the other options. In addition, it deals most effectively with the constraints imposed by local conditions and traffic patterns.

Mitigation

The avoidance and minimization of construction impacts to wetlands and wetland creation where impacts could not be avoided were considered. Wetlands lost during construction will be replaced on-site and in kind at a ratio of 1:1. Replacement wetlands would be developed within the existing ROW on the northeastern quadrant of the South Platte River crossing. This area would be graded to receive groundwater support, and wetland shrubs (willow cuttings), and grasses would be established. Additional replacement would be considered along the existing drainage channel between I-70 and the 46th Avenue South Platte River Bridge, and within any open drains to the river which would receive I-70 run-off. (See Figure 33.)

Wetland mitigation design would be coordinated with CDOT biologists and landscape architects, and coordinating state and federal agencies. To insure compatibility with existing Preliminary Design Studies prepared for the South Platte River (1989), wetland replacement and riparian habitat treatments will also be reviewed with Urban Drainage and Flood Control District representatives.

The majority of wetlands occupying the large point bar would be avoided by placing protective, temporary fencing. Impacts would be further minimized by placing geotextile fabric over the wetlands occupying the construction zone, then placing a layer of fill over the fabric prior to construction vehicle maneuvering. This action would add a level of protection to existing wetlands and demarcate the existing ground line when the fill is removed.

Wetlands would be protected from unnecessary impacts in the construction zone by adherence to a specification for the protection of existing vegetation to be included in the bid plans. This specification would include items such as the location of temporary fencing, placement of geotextile fabric, location of temporary fencing, placement of geotextile fabric, etc. In addition, an erosion control plan for the NPDES permit would be developed to be included in the contractor bid plans. This plan would address temporary sedimentation controls during construction and long-term controls through seeding, landscaping, and installation of adequate drainage structures/facilities.

Dewatering activities would follow CDOT project specifications which do not allow discharge onto wetlands or directly into the river, e.g., "Dewatering activities shall not allow pollutants to enter the Waters of Colorado, either surface or subsurface". During construction, live water would be kept separate from the work area to avoid excess sedimentation effects downstream. On-site storage and staging areas for construction materials, supplies, and equipment would be carefully located to minimize the potential for spills and leaching into wetlands and the South Platte River.

"Based upon the above considerations, it is determined that there is no practicable alternative to the proposed new construction in wetlands and that the proposed action includes all practicable measures to minimize harm to wetlands which may result from such use."

3.9 ECOLOGY

A. THREATENED OR ENDANGERED SPECIES

No plant or wildlife species listed or proposed for listing as threatened or endangered were identified within the project limits (See Appendix for coordination letters). The bald eagle, an endangered species, does winter along the South Platte River downstream of this crossing (CDOW 1989). The project area was re-surveyed during the late summer of 1992 and *Spiranthes diluvialis*, a federally threatened plant species, was not discovered.

Impacts

No direct project-related impacts would result to threatened or endangered species.

Mitigation

Specific mitigation for threatened or endangered species is not required for this project.

B. VEGETATION

The flora of the project corridor consists primarily of introduced landscape plantings or weedy species invading disturbed areas. A relatively natural flora occurs as wetlands on point bars along the South Platte River and is discussed in detail under the Wetland Finding section of this EA. A narrow band of riparian habitat is also present along the South Platte River, consisting primarily of plains cottonwood, peach-leaf willow, and smooth brome grass at the upper margins of wetlands and elm trees along the higher, dry margins and on riprapped slopes.

Landscape plantings along the corridor range from introductions within the I-70 right-of-way to relatively mature and diverse plantings in the adjacent neighborhoods and parks. Disturbed sites throughout the corridor are dominated by the common annual weeds summer cypress (*Kochia*), Russian-thistle, cheatgrass, Canada thistle, and bindweed. Along fence rows and minor drainages the Siberian elm is a common invading tree species of drier disturbed areas.

C. FISH AND WILDLIFE

A warmwater fishery is present in the South Platte River, consisting of common species including carp, white sucker, crappie, sunfish, and largemouth bass, among others (Propst 1980). Wildlife is relatively

diverse throughout the corridor, including species tolerant of noise and human presence and species of relatively undisturbed sites in terms of human activity, particularly along the South Platte River (mule/white-tail deer, muskrat, waterfowl and shorebirds, etc). The South Platte River is a local migration route for these species.

Impacts to Vegetation and Fish and Wildlife

A few trees of plains cottonwood, peach-leaf willow, and elm would be lost along the South Platte River where wider structures would be built. Landscape plantings within and closely adjacent to the existing I-70 corridor would also be removed prior to construction.

The South Platte River fishery would receive temporary, construction-related impacts due to sedimentation during runoff events and construction for pier placement which would require dewatering. Following project construction, the river would have a greater area of shading under the wider structures, resulting in the loss of adjacent streambank (riparian) and wetland vegetation. Wetland loss is discussed in detail under the Wetland Finding section of this EA.

Urban wildlife habitat would be lost adjacent to the corridor, as landscaping associated with dwellings would be removed. Additionally, habitat available to wildlife in the existing I-70 ROW would also be removed with the construction of the wider structure.

Mitigation

Mitigation would include the revegetation of all disturbed areas following construction per landscaping plans developed for the project. If immediate revegetation is not practical or possible, temporary seeding, or other practical erosion control methods would be employed.

Landscaping would be replaced according to specifications appropriate to aid in erosion control, provide wildlife habitat, and add aesthetic values. Replacement species would be selected dependant on local site conditions and compatibility following construction, to ensure greater revegetation success.

3.10 HISTORICAL PRESERVATION

A. LITERATURE REVIEW

A file search was conducted on March 24, 1991, at the State Historic Preservation Office. Published lists of the National Register, properties determined eligible for the National Register, past surveys, and the State Inventory of Cultural Resources were consulted for sites previously identified. The file search revealed no properties currently listed on or eligible to the National Register of Historic Places within the project's area of potential impact. The State Inventory of Cultural Resources did not contain any additional properties within the project area.

B. RESEARCH DESIGN

An intensive level survey of the project area was conducted April 25, 1991, by CDOT staff historian. This area falls under the RP3 Urbanization and Planning Context, and, based on previous knowledge about the area, it is expected that the Rail/Streetcar Period 1870-1920: Residential Development Context would apply (see D. Results). This is due to the fact that this area was predominately residential at one time.

C. HISTORIC CONTEXT

The town of Elyria was originally platted in 1881 by A.C. Fisk and C.F. Leimer of the Denver Land and Improvement Company. The town was likely named after Elyria, Ohio, a town in which Fisk lived for a time. A short time later, Colorado's smelting industry began to locate in the area, leading to increased residential development. The typical needs of school, sanitary, water, and street improvements lead to a vote for incorporation on July 21, 1890. Newspaper accounts reported that order was restored after the incorporation.

The first smelter to locate in the area was the Boston and Colorado Smelter, which moved from Black Hawk to Argo Junction in 1878 for better access to fuel and labor supplies. It was followed shortly by the Omaha and Grant Smelter, which opened for business in Leadville in 1878, but relocated to Denver after the plant burned in 1882. The largest producer in Colorado, the Grant complex was located on the present site of the Denver Coliseum at Humboldt and 46th. In 1886, the Globe Smelter was built in the area now known as Globeville. By 1890, smelting had become the area's largest industry, employing over 1800 workers.

As the smelting industry expanded, small communities developed around the area. Globeville, Elyria, and Swansea were small towns that provided housing for smelter workers. Many of the workers came from Southern and Eastern European countries, creating a largely ethnic population composed of Slavs and German-Russians in each of the towns. In 1902, Elyria and Globeville became part of the City and County of Denver.

In 1899, eighteen of the largest smelters, including the Grant and Globe Smelters, formed the American Smelting and Refining Company (ASARCO). Within three years, however, many of the smelters were being shut down. In 1899, smelter workers, who had been working 12 hour shifts, demanded that their hours be reduced. A law was passed that mandated 8 hour shifts, but many smelter owners also reduced wages to cover the lost hours. The law was then declared unconstitutional. Workers then demanded reduced hours without reduced pay, but ASARCO owners refused. In 1903, the workers voted to strike the Globe and Grant Smelters which resulted in the

complete shut down. The Grant Smelter was permanently closed in 1905, a loss which created massive unemployment. Within a short period, the smelting industry had been replaced by meatpacking, as the Denver Union Stockyards, located between Elyria and Globeville, expanded. Thus the smelter workers were able to continue living nearby and shifted to a new line of work.

The fire station was built in 1939 at a cost of \$23,000 - no significant alterations have occurred since the building was completed.

In 1938, the Public Works Administration (PWA) offered a grant of \$12,000 or 45% of the cost of construction and equipment for a new fire station in the Elyria neighborhood (Federal Emergency Administration of Public Works, Project # Colo 1270-F). The station was built on the site of the old Company No. 9 Station, built in 1890 for the Elyria Fire Department. - The City's estimate for construction turned out to be \$3,000 lower than the lowest bid for construction of the new station (the City's estimate was \$22,400, the lowest bid came in at \$27,057). The City was forced to ask PWA to allow them to revise the plans without resubmitting them for approval to accommodate the higher bids and also the Fire Department's request to move the kitchen from the second floor to the first floor, which would require an additional wing (eventually the kitchen took space intended for a recreation room, and the wing was never built). The new station was turned over to the City on June 5, 1939 - the total cost came to \$23,000.

The National Western Stock Show has its roots through efforts of the Colorado Cattle and Horse Growers Association (founded in 1867) to hold a yearly cattle exposition in Denver. In January of 1906 two rival national cattle and livestock associations were holding their annual conventions in Denver with plans to merge the two organizations. The meeting was scheduled to coincide with the local Western Stock Show, which had been held sporadically since 1899. In honor of the national convention, local groups, including the Denver Chamber of Commerce, the Denver Daily Record Stockman and other Denver dailies, and area businessmen wanted to plan a livestock show that would be "second only to the great International in Chicago".

A large tent loaned by the Floto Shows Company was erected near the Exchange Building in the Denver Union Stockyards, and 150 horse stalls and a large number of pens were constructed under the tent. The show opened January 29, 1906 and is considered to be the first official stock show. The first show was so successful that the Western Livestock Show Association was formed to operate the show on an annual basis. The event has been held in January every year since 1906 with only one exception: the 1915 show was cancelled due to an outbreak of hoof and mouth disease.

After the first show, the Union Stockyard Company was asked to build a 10,000 seat pavilion, including a 90' x 180' judging ring, and a horse barn. The company, which owned the land to the southeast of the Exchange Building, graded the area and made plans for a large two story brick horse barn (a horse department was added to the 1907 show), and a 200' x 350' pavilion. The barn, with horse stalls on the lower floor and pens for sheep and hogs on the second floor, would serve as a marketplace year round. The horse barn was built in time for the 1907 show but a 150' x 175' tent, made by the Shafer Tent and Awning Company served as the pavilion once again.

After the 1907 show, the Stockyard Company proposed building more barns and a pavilion for \$100,000 to \$150,000. However that summer, they built a large open frame stadium which enclosed an amphitheater seating 2000-3000 and covered with the top of the 1907 tent. This was not the promised pavilion, but served the 1908 Stock Show adequately. A wood frame cattle barn was also completed for the 1908 show.

The Stockyard Company made another offer to build the pavilion in 1908 if the Western Stock Show Association would raise \$50,000.

Tired of hosting the show in a tent, the Association raised the money and in May of 1908, ground was broken for the National Amphitheater (the building now known as the Stadium Arena). The \$200,000 two-story brick building opened January 18, 1909 in time for the annual stock show.

Over the next few years, other buildings were constructed to house cattle, horses, and exhibits. In 1910, a three story brick horse barn was built north of the amphitheater fronting Lafayette Street on the eastern perimeter of the show grounds. In 1939, funds were obtained from the WPA to build a two story concrete cattle barn (known as the WPA Cattle Hall) on the west side of the amphitheater. The coliseum was built on the south side in 1950.

In 1972, all of the original buildings except for the National Amphitheater and the WPA Cattle Hall were demolished to make way for the large precast, reinforced concrete Hall of Education. The area has since been landscaped and parking lots built surrounding the complex. In 1989, Denver residents passed a bond issue which provided funding to renovate the aging amphitheater. The WPA Cattle Hall was demolished in June of 1990, leaving the amphitheater as the only remaining original structure in the complex. Its integrity has been compromised with construction of a new concourse on the west side and a new entrance on the east. All but a small corner on the southeast corner of the building has been enclosed by new construction.

D. RESULTS

The survey area was mixed with residential, commercial, and industrial structures. The area between Washington and Brighton Boulevard, historically a residential neighborhood known as West Elyria, has become heavily mixed with industrial and commercial buildings. The commercial and industrial development along Brighton Boulevard has for the most part cut West Elyria off from the main residential area of Elyria. Therefore, the integrity of this area as a residential neighborhood has been lost. No additional sites of historic significance were located within the project area.

As indicated in the Research Design, these buildings in West Elyria fit into the Urbanization and Planning Context, Rail/Streetcar Period 1870-1920: Residential Development Context. Many of these homes were built to house workers at the nearby smelters. These resources will not, however, augment present knowledge about this context for the following reasons:

1. There are better, more intact examples of the working class smelter neighborhoods in existence in Denver (Globeville, Garden Place, Swansea, and the main part of Elyria east of Brighton Boulevard to name a few).
2. This area has been significantly altered with the introduction of warehouse, industrial, and commercial type structures.
3. The architectural styles of the residences are not significant, nor are they good examples of typical working class housing; many houses in this area have been altered and have lost their integrity.

In consultation with representatives of the State Historic Preservation Office (SHPO), and based on the above discussion, it was determined that none of these resources were eligible to the National Register of Historic Places. Since there are no historic resources in the project area, the Colorado Department of Transportation has determined that this project would have no effect on historic resources and that no further study of the project area will be required. See letter in Appendix from SHPO regarding its concurrence that this project will have no potential to effect historic resources.

3.11 ARCHAEOLOGICAL AND PALEONTOLOGICAL PRESERVATION

A. ARCHAEOLOGICAL RESOURCES

An on-the-ground reconnaissance of the project area was carried out in 1991 by CDOT's staff archaeologist. No significant archaeological resources were found. The potential for historic and prehistoric archaeological remains to be found within the project area were viewed as limited. This is primarily due to heavy impacts resulting from commercial and residential development. Historic research indicated that much of the early development in the area was industry oriented and subsequently destroyed by the construction of more recent structures. If any archaeological resources are exposed during construction activities, the CDOT staff archaeologist will be notified so that the resources can be evaluated in accordance with National Register criteria.

B. PALEONTOLOGICAL RESOURCES

An on-the-ground reconnaissance of the project area was carried out in 1988 by CDOT's staff paleontologist. No fossils were seen. Three fossil localities cited in Hunt (1954: 105-106) lie within the I-70/Brighton Boulevard study area. The Denver Museum of Natural History (DMNH) has two horse molars, and two horse teeth associated with two mammoth tusks and part of a femur (thigh bone), from gravel pits at 4800 Brighton Boulevard and 52nd and York, respectively. DMNH also has a mammoth tusk from 48th and Gilpin Streets, which may be the same locality as 4800 Brighton Boulevard. These specimens were recovered in areas mapped (Lindvall 1980) as late Pleistocene Broadway Alluvium. This unit is known to be fossiliferous elsewhere in the Denver metropolitan area.

Of particular concern is the historically most paleontologically productive unit, the Denver Formation. The Denver Formation has produced Late Cretaceous leaves and dinosaur bones and early Paleocene leaves and mammal, reptile, and amphibian bones and teeth in the Denver and Colorado Springs metropolitan areas (Brown 1962; Middleton 1983). A latest Cretaceous Denver Formation fossil flora collected at the Littleton railroad grade separation excavation is considered quite possibly the best of its age in the world, based on its diversity (50 species) and quality of preservation (Gary Upchurch, personal communication, 1988). Arguably the best or second best earliest Paleocene (immediately postdating the extinction of the dinosaurs) fossil mammal locality is located in a vacant lot and under an office building in Littleton where it was uncovered by office park construction.

The Denver Formation probably lies in a relatively shallow depth under a thin veneer of Holocene overburden under the I-70/Washington Street interchange where replacement of piers for the eastern ramps is proposed. As design plans for construction projects within the study area become available, the necessity for on-site paleontological monitoring of bedrock excavation would be determined by the staff paleontologist since opening fresh cuts in any of the above-named geologic units could reveal fossils. In the event paleontological resources are uncovered from any unmonitored geologic unit during construction, the staff paleontologist would be notified immediately.

3.12 HAZARDOUS WASTE

In accordance with Federal Highway Administration guidelines, the potential for highway projects being impacted by lands which may harbor hazardous waste must be evaluated. CDOT avoids hazardous waste wherever possible. If a project cannot be reasonably designed to avoid hazardous waste areas, steps must be taken to ensure that adequate protection is afforded workers and the community, prior to, during and after construction. Steps must also be taken to recover the clean-up costs from the responsible party.

Hazardous waste may be pesticides, organic compounds, heavy metals, some household products, and petroleum products, which because of its quantity, concentration, or physical, chemical or infectious characteristics, may pose a hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

This chapter summarizes the findings found in the Preliminary Site Investigation for the Modification of Interstate 70, Washington Street to Brighton Boulevard (Walsh and Assoc., as revised May 15, 1992).

A. FORMER AND CURRENT LAND USE AND SAMPLING RESULTS

Methodology

To identify properties with the potential of contamination an Initial Site Assessment (ISA) was conducted. Along with site inspections, the following sources were reviewed: Denver City and Householder's Directories (varying years between 1940 and 1990) pre-I-70 aerial photos (1958), and an Ensite Environmental Records Search. The Ensite report contains information obtained from public records on reported spills, Resource Conservation and Recovery Act (RCRA) hazardous waste notifiers, Colorado Department of Health (CDH) landfill lists, Comprehensive Environmental Response Compensation and Liability Act (CERCLA) listings, and reported underground storage tank (UST) listing. From the data reviewed, these lists identify suspected or known sites that store, treat, transport, or dispose of hazardous wastes. Other sources of information were searched to determine past land use activity of selected sites that may be impacted by this project.

Preliminary Site Investigation (PSI) activities identified soil and ground water tests and test areas to further characterize the properties of risk. Seventeen test holes were drilled to bedrock or to a total depth of 40 feet on selected properties. Test hole and surface soil sampling locations are shown on the Site Map in Figure 34. Soil samples were collected at 5-foot intervals as conditions allowed. Soil samples of discreet intervals and those composited were analyzed selectively based upon field observations. Ground water was sampled through piezometers installed in the test holes.

Over 175 tests were conducted on soil and ground water samples. Soils and ground waters were analyzed for over 50 volatile and over 100 semi-volatile organic compounds which are on the Target Compound List using EPA approved testing methods. Volatile compounds are basically those which tend to evaporate while semi-volatile compounds do not.

Soils and ground waters were also analyzed for 16 metals on the Hazardous Substance List. The soil digestion method was employed to determine the "total" metal content of the sample. For ground water samples, the analytical method measured dissolved metal content.

Waters from one half the total number of test holes were tested for gross alpha and gross beta radioactivity, while waters from fourteen test holes were evaluated for suitability of surface discharge.

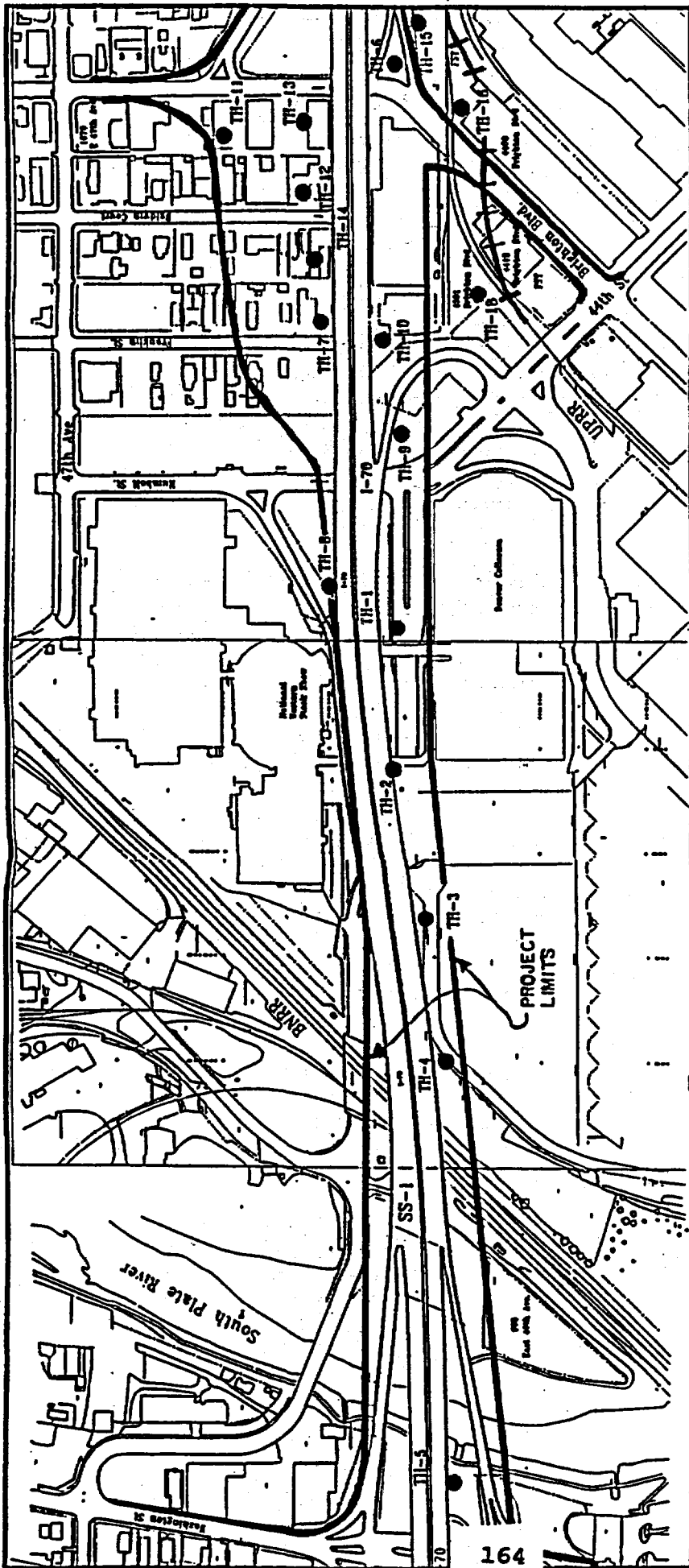


FIGURE 34
SOIL AND GROUNDWATER
TEST SITES

- Explanation**
- Exploratory Boring (TH)
 - Surface Soil Sample

0 300'
SCALE

B. PROPERTY EVALUATION

This section summarizes the findings of the ISA, PSI, and sampling and analysis (S&A) conducted on the properties potentially impacted by this project. Table R further summarizes any potential environmental concerns with the acquisitions of the properties.

1. Denver Coliseum
4600 Humboldt Street
Location of TH-1, TH-2, TH-3, and TH-4

ISA: The property impacted lies along the northern border of the Denver Coliseum grounds. Two USTs are located on the south side of the building. (See Figure 35) To the west and southwest of the Coliseum, a parking lot is located in a topographic depression in what appears to be an excavated area. Prior to the parking lot, several small ponds were thought to exist in the deepest parts of the depression. These depressions may have been used for dumping prior to construction of the Coliseum in 1952. Topographic expression suggests that the parking lot was once a sand and gravel pit. If any sand and gravel quarrying occurred, the mining was probably prior to the mid-1920s.

The Omaha and Grant Smelter once occupied a site southwest of the Coliseum building, just south of the present parking lot. The smelter, which produced gold, lead, silver, and copper between 1883 and 1902, was one of three former ore processors located within the city limits of Denver. The environmental concern is that smelter by-products (e.g., slag) could have been spread northward onto the Coliseum grounds to fill the ponds and excavated area.

S&A: Test hole locations were selected to evaluate the potential impact of smelting activity or USTs on soils and ground waters as well as determine the suitability of ground waters for discharge to surface drainage.

Four test holes (TH) were drilled at the Denver Coliseum to evaluate a narrow strip of land to be impacted by this project. Three test holes (TH-2, TH-3, and TH-4) encountered an anomalous black fill material on the Denver Coliseum grounds. This fill was predominately a sandy grit containing concrete, wood, wire, glass and metal fragments in addition to natural sands and gravels. The black fill generally began at depths less than 1 foot below the asphalt covering the parking lot. It varied in thickness from approximately 15 feet in TH-3 thinning to less than 5 feet in TH-4. Since soil samples were collected at 5 foot intervals, none of the soil samples submitted for metals analysis from TH-4 contained any black fill material. The concentration of soil metals reported from TH-4 are probably representative of the underlying natural sediment. TH-2 encountered roughly 13 feet of black fill material. Small pieces of smelter slag were tentatively identified. Test hole TH-1, drilled just north of the Denver Coliseum building, did not encounter the black fill material. The absence of Photoionization Detector (PID) readings indicated no volatile organic compounds were present although a relatively small amount of organic matter degradation may be occurring due to low methane measurements.

Water was not in contact with the black fill in TH-2 and TH-4 while in TH-3 the black fill extended about 5 feet below the water table. Ground waters recovered from TH-2 and TH-4 were a natural silty brown color while that recovered from TH-3 was silty gray. Ground water from these testholes is not contaminated with elevated metal concentrations from the overlying material. Ground water sampled from TH-1 did contain some low concentrations of volatile gasoline constituents. The contaminant source is unknown.

**TABLE R
POTENTIAL ENVIRONMENTAL CONCERNS WITH RIGHT OF WAY ACQUISITIONS**

| BUSINESS NAME/PROPERTY OWNER AND ADDRESS | ENVIRONMENTAL CONCERN |
|--|--|
| Hydraulic Equipment Repair 4550 Brighton Blvd ▲ | Former site of a petroleum distributor, Oil and PAHs in shallow soil. Minimal environmental risk with partial acquisition. |
| Central Storage Facility (SSI) 4400 Brighton Blvd + | Former site of wool and hide tanning operations. Elevated lead in soil. Minimal environmental risk. |
| Lambert Auto Parts 4605 Brighton Blvd | Auto repair business and formerly site of a gas station. Minimal environmental risk, soils beneath building may require proper disposal or handling. |
| Lambert Auto Electronics 4619 Brighton Blvd | Auto repair business. Minimal environmental risk, if waste oil UST removed/clean closure report filed with CDH. |
| Lambert Parking Lot 4637 Brighton Blvd | Down gradient from waste oil UST and auto repair business. Minimal risk with clean closure report. |
| Lambert Warehouse Parking 4655 Brighton Blvd | None identified. |
| Lambert Warehouse 4661 Brighton Blvd | None identified. |
| Lambert Storage Lots 4632-43 Baldwin Court | None identified. |
| Triangle Farm Supply 4435 Brighton Blvd | None identified. |
| Roger's Warehouse 1670 E. 46th Avenue | None identified. |
| Darko's Automotive 1633 E. 46th Avenue | Former Auto Body shop. Elevated soil metals and PAHs. Minimal environmental risk with dust control and proper disposal or handling. |
| VRM Partners/Western Boom 4415 Brighton Blvd | Site of former petroleum distributor. Evaluate soil and ground water quality prior to purchase. |
| Roger's Warehouse 4567 Brighton Blvd | None identified. |
| Elf's Machine Aluminum Welding 4614 Baldwin Court | Former auto body shop. Minimal environmental risk. |
| O.G. Valentine storage lot and UPRR spurline 4501 Brighton Blvd ▲ | PCE concentration in ground water equals MCL, PAHs are commonly associated with railroad operations. |
| O.G. Valentine Lumber 1610 E. 46th Avenue | UST needs to be removed and clean closure report filed with CDH. |

TABLE R cont'd
POTENTIAL ENVIRONMENTAL CONCERNS WITH RIGHT OF WAY ACQUISITIONS

| BUSINESS NAME/PROPERTY OWNER AND ADDRESS | ENVIRONMENTAL CONCERN |
|---|--|
| Denver Fire Station No. 9 4600 Franklin Street | Benzene concentration in ground water exceeds MCL. Minimal environmental risk, if diesel UST removed/clean closure report filed with CDH. |
| Residential 4610 Franklin Street | Minimal environmental risk but down gradient from benzene contaminated ground water. |
| Residential 4632 Franklin Street | Minimal environmental risk, but down gradient from benzene contaminated ground water. |
| Witulski Parking Lot 4601 Franklin Street | Minimal environmental risk, but down gradient from benzene contaminated ground water. |
| Residential 4619 Franklin Street | Minimal environmental risk, but down gradient from benzene contaminated ground water. |
| Residential 4631 Franklin Street | Minimal environmental risk, but down gradient from benzene contaminated ground water. |
| Residential 4631 Franklin Street | Minimal environmental risk, but down gradient from benzene contaminated ground water. |
| NWSS Parking Lot 4640 Humboldt Street + | Minimal environmental risk, but down gradient from PCE contaminated ground water. |
| NWSS Parking Lot I-70 Exit Ramp to 44th Street + | Minimal environmental risk, but PCE concentration in ground water exceeds MCL. |
| City & County of Denver Denver Coliseum - | Elevated soil metals. Minimal environmental risk with permanent easement, dust control, and proper disposal or handling. Moderate acquisition risk if properties are to be acquired. |
| BNRR property I-70 Frontage Road - | Minimal environmental risk with permanent easement. None identified, PAHs present on adjacent property. |
| Katz property 900 E. 46th Avenue + | None confirmed. |
| Alternate Relocation Site for Fire Station No. 9 3757 Brighton Blvd | Requires evaluation. |
| Potential Relocation Site for Fire Station No. 9 4201 Brighton Blvd | Requires evaluation. |

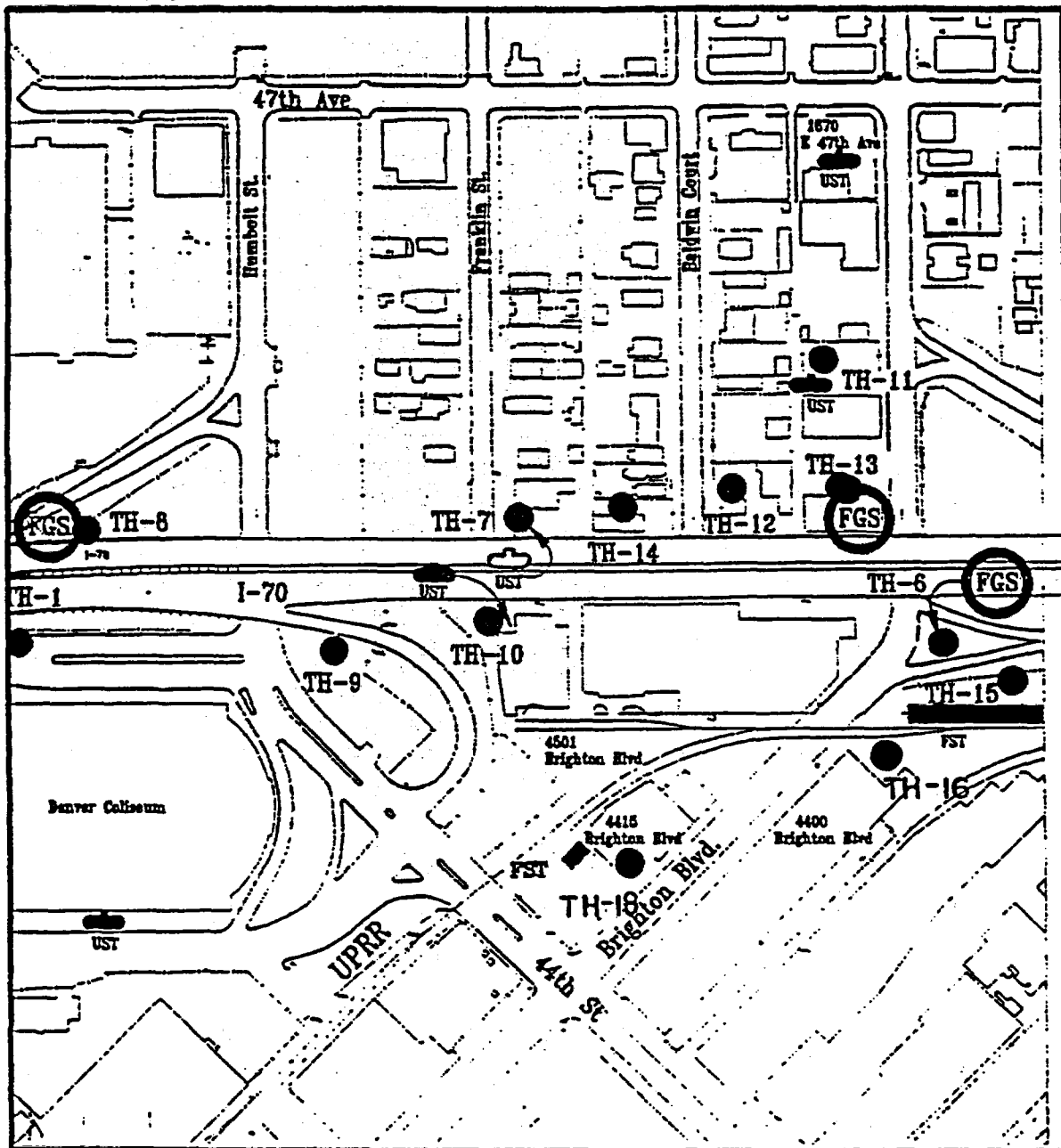
+ Partial Acquisition

- Permanent Easement

▲ No Acquisition Expected

Properties with no symbol - total acquisition expected.

Residential properties not listed but formerly identified as total acquisitions - minimal environmental concern.



LEGEND

- TEST HOLE
- (FGS) FORMER GAS STATION
- FST FORMER SURFACE TANKS
- UST UNDERGROUND STORAGE TANKS
- UST REMOVED STORAGE TANKS

0 250'
APPROXIMATE SCALE

FIGURE 35

**POTENTIAL SOURCES OF
PETROLEUM CONTAMINATION**

Black fill material from TH-2 was submitted for Toxicity Characteristic Leach Procedure (TCLP) metals analysis and the results indicate the material is not a hazardous waste by characteristics of the Resource Conservation and Recovery Act (RCRA). The concentration of metals from TH-2 are presented in Table X. Table X compares the values of the U.S. typical, and the Urban Background Levels established by CDH, and the proposed action levels for remediation of contamination from the Globe plant for arsenic, cadmium, lead, and zinc. The data in Table X indicates arsenic (As), barium (Ba), copper (Cu), lead (Pb), manganese (Mn), silver (Ag), and zinc (Zn) are present in TH-2 in concentrations above the U.S. typical range of values. Copper (1100 ppm), lead (3000 ppm), and zinc (25000 ppm) exceed the upper limit of the U.S. typical range by at least an order of magnitude (10X). The concentration of lead at TH-2 was 3,000 ppm, in excess of the recommended action level for lead in soils near the Globe plant (500 to 1000 ppm). The concentrations of these metals are highest in TH-2, drilled northwest of the Coliseum building, and appear to diminish westward toward TH-3 where no metal concentration exceeds the U.S. typical range.

The high metal content of portions of the black fill may originate from former smelting operations in the vicinity. PAH's were detected in the black fill material encountered in TH-2 and TH-3. Commonly PAH's originate from the incomplete combustion of fossil fuels. Their presence may indicate coal ash from the smelter furnace is present in the fill.

Recommendation: CDOT would be expected to acquire a permanent easement of some Coliseum land. Intrusive activities such as utility relocations and structural footings supporting elevated I-70 may encounter black fill material from immediately west of TH-1 to the BNR tracks. Black fill material which is excavated during construction should be removed off-site for disposal at an approved facility or re-used on-site under a written plan with the approval of the CDH. Much of the area where the black material was encountered has been paved, which prevents direct exposure to humans and wind transport of the material. The continued containment of the material beneath pavement or other cover is recommended.

2. CDOT Property East of Washington Street at I-70
Location of TH-5

ISA: The location was selected to determine the suitability of ground waters for surface discharge.

S&A: One test hole was drilled on CDOT property east of Washington Street south of the elevated deck of I-70. No semi-volatile compounds or elevated concentrations of metals were detected in soil or ground waters. The field screening of soils did not indicate the presence of volatile compounds.

Recommendation: None required.

3. CDOT Traffic Island
Approximately 4590 Brighton Blvd.
Location of TH-6

ISA: Boulevard Standard Service (city directories 1960, 1957, and 1954) formerly occupied the drilling site. The service station is visible in the 1958 aerial photo, but no surface petroleum storage tanks were noted.

S&A: TH-6 was drilled on CDOT property in the traffic island formed by the entrance ramp to eastbound I-70 from Brighton Boulevard. This test hole was drilled to assess any potential hydrocarbon contamination of soil or ground water originating from the service station and to collect data on the ground water for a discharge permit. There were no contaminants detected in the soil sample.

Ground water recovered from TH-6, contained low levels of chlorinated solvents but no other contaminants. Chlorinated solvents were not present in the soil sample from this test hole. Tetrachloroethene (PCE) is present in the water sample at 4 ppb. The MCL for PCE is 5 ppb. TH-6 also contained methylene chloride at 20 ppb. Ground water from TH-6 was resampled to monitor the concentration of PCE. The second sampling of ground water contained PCE at 3 ppb, Methylene chloride was not detected.

Recommendation: See discussion on the chlorinated solvent plume.

4. Denver Fire Department Station No.9
4600 Franklin St.
Location of TH-7

ISA: Since its construction in 1939, this structure has been used solely as a fire station. One UST is registered with the state at this address. (See Figure 35) In June 1992, the Denver Fire Department removed the tanks and began the tank closure process with CDH.

S&A: TH-7 was drilled just southeast (upgradient) of a diesel UST and dispenser off the southwest corner of the fire station. No volatile compounds were detected in a soil sample collected above the water table at a depth of 25-26.5 feet. Volatile organic compounds in ground water included benzene (150 ppb), in excess of the federal MCL (5 ppb) and the more stringent state standard of 1 ppb which would be the applicable standard. The presence of volatile organic compounds is more consistent with a gasoline origin than diesel.

Since none of these compounds were present in soils analyzed, the contaminated water may have migrated to this address from off-site or could be related to past gasoline usage of the fire station UST. The gasoline dispenser or UST at O.G. Valentine or another up-gradient source may be the origin of this contamination.

Recommendation: The corrective action plan required of the Denver Fire Department by CDH will determine the extent of and detail plans to remediate contaminated ground water in the vicinity of Fire Station 9. This property is to be acquired by CDOT. (See Gasoline Contamination discussion.)

5. O.G. Valentine
1608 East 46th Avenue
Location of TH-10

ISA: This wholesale lumber company has been operating at this address since at least 1965 according to city directories. Prior to O.G. Valentine, other building supply outlets occupied the site. An old, unused gasoline dispenser is present near the northwest corner of the building. The associated tank has not been removed, and is apparently empty.

S&A: The location of TH-10 down-gradient (northwest) from the unused UST was selected to evaluate soils and ground water for possible hydrocarbon contamination and to obtain discharge parameters.

Black soil staining with a gasoline odor was encountered at approximately the water table (28.5 feet). A significant PID reading (220 ppm) confirmed the presence of volatile organic compounds in soils recovered from 30-31.5 feet. Both soil discoloration and PID readings diminished with depth below 31.5 feet. Gray discolored water with a petroleum sheen was recovered during water sampling.

Laboratory analysis of a soil sample from a depth of 30-31.5 feet found concentrations of gasoline constituents. Naphthalene and 2-methylnaphthalene were semi-volatile compounds detected in composited soils from this site. Volatile compounds present in water did not exceed their corresponding MCLs. Semi-volatile compounds, commonly associated with gasoline, were detected in ground water. (See Table V - Gasoline Contaminants in Groundwater.)

Recommendation: This property has been identified for acquisition. Analytical results do not preclude the possibility of off-site contaminant migration with ground water northwestward under East 46th Avenue and properties beyond. Without additional data it is impossible to define the source or extent of contamination. The UST at O.G. Valentine or another unidentified up-gradient source potentially represent contaminant sources. The extent of contamination and clean-up requirements would be determined during the tank closure process with CDH. (See Gasoline Contamination discussion.)

6. Storage Lot South of O.G. Valentine
4501 Brighton Boulevard
Location of TH-18

ISA: This parcel is apparently owned by the UPRR but used for lumber storage by O.G. Valentine. Two sides of this pie shaped property are bounded by UPRR tracks. Railroad tracks frequently represent sources of soil or ground water contamination originating from spills during transport or during unloading operations. Polycyclic aromatic hydrocarbons (PAHs), formed by the incomplete combustion of fossil fuels, are also commonly associated with railroad properties. This property is adjacent to and immediately down-gradient from petroleum distributors once located at 4415 Brighton Boulevard.

S&A: One test hole was drilled on this property. PCE and MTBE were detected in ground water recovered from TH-18. The concentration of PCE was 5 ppb, which equals the MCL, and the concentration of MTBE was 890 ppb. No MCL Standard has been established for MTBE. No TCL semi-volatile compounds were detected in soil or ground water. Compounds tentatively identified in shallow soils (0.0-0.5 feet) included an unknown oxygenate (2500 ppb), an unknown paraffin (3000 ppb), and an unknown bio-organic compound (2700 ppb). An unknown nitrogen compound (84 ppb) was detected in ground water.

Recommendation: This property has not been identified for acquisition but was tested to evaluate any potential impact caused to it by railroad operations and the adjacent former petroleum distributors. (See number 7, VRM Partners) (See Gasoline Contamination discussion.)

7. VRM Partners/Business Vacant
4415 Brighton Boulevard

ISA: VRM Partners apparently purchased this property from the UPRR approximately ten years ago. Businesses occupying the structure include a roofing company and a crane company. In the 1958 aerial photo, eight surface storage tanks were noted adjacent to the railroad spur

servicing this address. (See Figure 35) City directories indicate a series of petroleum distributors have occupied this address between 1940 and 1974. Spills of hydrocarbon liquids may have occurred during product transfer from train cars to storage tanks or from storage tanks to trucks.

S&A: None conducted since access to this property was denied. The analytical results of soil and ground water from TH-18 should not be construed as clearing the acquisition of 4415 Brighton Boulevard, since soil and ground water quality at the site have not been analyzed. The low concentration of paraffin in surface soils sampled from TH-18 may be related to the former surface tanks or adjacent railroad operations.

Recommendation: This property has been identified for acquisition to relocate the UPRR spur line. Soils and ground water at this address would need to be evaluated primarily for potential hydrocarbon contamination prior to acquisition. (See Gasoline Contamination discussion.)

8. CDOT Property Leased to National Western Stock Show
Approximately 4601 Humboldt Street
Location of TH-8

ISA: The site was formerly part of Naptha Products Service Station (city directories, 1945, 1940, and 1935) in addition to Pete's Oval East Service Station (city directory 1950). The gas station is visible on the northeast corner of East 46th Avenue and a north-south street immediately east of the NWSS Stadium in the 1958 aerial photos. The location of the former service station is indicated in Figure 35. No surface storage tanks are noted in the photos. The freeway entrance ramp and NWSS parking areas currently occupy the site of the former service station.

S&A: The location of TH-18 was selected primarily to evaluate soils and ground water for potential hydrocarbon contamination. Laboratory analysis of soils and ground water from TH-8 did not indicate any Target Compound List (TCL) semi-volatile compounds or elevated concentrations of Hazardous Substance List (HSL) metals.

Recommendation: None

9. National Western Stock Show Parking Lot
44th Street East of Coliseum
Location of TH-9

ISA: The area will be partially overlain by the proposed exit ramp from eastbound I-70 to Brighton Blvd. This test hole location was chosen to evaluate soils and ground water for metals arising from smelter operations as well as possible contaminants originating from eight surface storage tanks (from 4415 Brighton Boulevard) visible up-gradient (south) in the 1958 aerial photo.

S&A: TH-9 was drilled on National Western Stock Show (NWSS) property across 44th Street from the Denver Coliseum. The test hole is immediately south of the I-70 eastbound exit ramp to 44th Street. Ground water recovered from TH-9 (NWSS) contained a low level of chlorinated solvents. Tetrachloroethene (PCE) was detected in the water sample from TH-9 (6 ppb). The MCL for PCE is 5 ppb. Chlorinated solvents were not indicated in soil samples from this test hole. Methyl t-Butyl Ether (MTBE), a gasoline additive, was also detected in ground waters from TH-9 (78 ppb). An MCL for MTBE has not been established. Soils tested for metals fell below the U.S. typical range.

Recommendation: There would be minimal environmental risk with a portion of this property. (See chlorinated solvent plume discussion.)

10. Lambert Businesses

4605, 4619, 4661 Brighton Boulevard
Location of TH-11 and TH-13

ISA: The Lambert businesses impacted by this project are Lambert Auto Parts, 4605 Brighton Boulevard, Lambert Auto Electronics, 4619 Brighton Boulevard, and Lambert Warehouse (truck parts), 4661 Brighton Boulevard. An elongated aluminum building is present on both the 4605 and 4619 Brighton Boulevard addresses containing multiple auto service bays. Barrels and an underground storage tank (UST), currently used for waste oils, are present north of Lambert Auto Electronics.

City directories indicate Lambert Auto Electric has occupied this site since 1950 while Lambert Auto is first listed in 1974. Industrial Medical Center (1970 and 1974) and Kellogg Grain Company (1957 and 1960) occupied the 4661 Brighton Boulevard address prior to the truck supply warehouse. Prior to construction of Lambert Auto Parts, a series of gas stations occupied this site. Service stations listed in city directories include Roy's Service Gas Station (1965), Shaylor Imel Service Station (1960), Ross and Sons Service Station (1954 and 1957), and Tom's Service Station (1950). Aerial photos (1958) substantiate the existence of a gas station at this address but no surface petroleum storage tanks. The location of the former service station is indicated in Figure 35.

S&A: Two test hole locations were selected to determine if hydrocarbon contamination from the gas station or contaminants related to the auto repair businesses (e.g., waste oil) have adversely impacted either 4605 or 4619 Brighton Boulevard. TH-13 was drilled down-gradient from the site of the former service station since the building blocks the ideal drilling site. Black to dark gray discolored soils were noted just below the water table (28.5 feet). A gasoline odor and PID reading (120 ppm) were recorded from these soils. Soils appeared natural in color 12 feet below the top of water and exhibited a minor PID reading. Ground water sampled was gray/brown in color and appeared to be contaminated.

Ethylbenzene (180 ppb) was detected in soils from TH-13 which were sampled between 30-31.5 feet. Three plasticizers were detected in soils in the contaminated interval (30-41 feet). These semi-volatile compounds are probably related to the observed gasoline contamination. Volatile organic compounds in ground water at TH-13 were lower than their respective MCLs. (See Table V)

Semi-volatile compounds commonly associated with gasoline were detected in ground water. Although no visible soil contamination was evident from the surface to the water table, it is difficult to assess the magnitude of potentially contaminated soils beneath the building. The presumed source (USTs) were apparently removed prior to construction of the current structure in approximately 1974.

TH-11 was drilled in the northwest corner of the property down-gradient of the UST used for waste oils, north of the west end of the building at 4619 Brighton Boulevard. (See Figure 35.) No evidence of leakage was found in soils or ground water analyzed from TH-11.

Ground water recovered from TH-11 contained a low level of chlorinated solvents. Chlorinated solvents were not present in the soil sample from this test hole. See the chlorinated solvents plume discussion.

Recommendation: These properties have been identified for acquisition. Any potential intrusive activity such as utility relocations or caissons for piers for the I-70 overpass of Brighton Boulevard may encounter petroleum contaminated soils under the building occupying 4605 Brighton Boulevard. A qualified health and safety officer should monitor any intrusive activities for airborne volatile organic compounds. Soils excavated from this site would have to be treated as required by CDH. (See discussion under D. Proposed Action - Underground Storage Tanks (UST) and Petroleum Contaminated Soils.)

11. Elf's Machine Aluminum Welding
4614 Baldwin Court
Location of TH-12

ISA: Elf's Machine Aluminum Welding is a tool and dye shop and tires, gutted cars, and barrels were present on the property. City directories indicate a series of body shops have occupied the site since 1957. Contaminated soils and ground waters can occur as a consequence of body shop workings.

S&A: The location of TH-12 was selected to determine if body shop operations have adversely affected the condition of this property and to obtain data needed for a ground water discharge permit. No soil contaminants were detected. Ground water recovered from TH-12 contained a low level of chlorinated solvents. Chlorinated solvents were not present in the soil sample from this test hole.

Recommendation: There would be minimal environmental risk with the acquisition of this property. See discussion on the chlorinated solvents plume.

12. Darko's Automotive
1633 East 46th Avenue
Location of TH-14

ISA: Darko's Automotive is an auto body shop. Numerous automobiles and auto parts as well as several small barrels possibly containing waste oil were present in the lot. City directories indicate other body shops have occupied the site since 1950. The structure housed Stockman's Signs from the mid 1950's to approximately 1980.

S&A: The location of TH-14 was selected to evaluate the effects of body shop operations on soils and ground water at this address. Analysis of soil metals (0-1.5 feet) from TH-14 revealed four metal concentrations (cadmium, lead, mercury and zinc) exceed the U.S. Typical Range. Most significant was mercury (1.7 ppm) which was greater than twenty times the upper limit of the U.S. Typical Range. (See Table X) PAHs and other semi-volatile organic compounds totaling 245,000 ppb were also detected in the sample. Black soil, thought to be indicative of the contaminants detected, was not observed to extend downward below four feet and was underlain by a thin natural clay layer. Ground water sampled from TH-14 did not contain metals or PAHs detected in the shallow soil sample. The absence of contaminants in ground water suggests the metals and PAHs in these soils are relatively immobile and do not threaten ground water quality. The origin of the soil metals and semi-volatile organic compounds is not apparent, but may be attributed to use of smelter debris as fill or as a result of prior practices by former occupants.

Ground water recovered from TH-14 contained a low level of chlorinated solvents. Chlorinated solvents were not present in the soil sample from this test hole. Methyl t-Butyl Ether (MTBE), a gasoline additive, was also detected in ground waters from TH-14 (32 ppb). An MCL for MTBE has not been established. See the discussion on chlorinated solvents plume.

Recommendation: This property has been identified for acquisition. The toe of clean fill designed to support I-70 at the site should be extended to a depth of at least two feet to prevent dermal exposure and wind transport of contaminated material. A dust suppression technique used during construction activities will minimize the potential for wind transport of contaminated soils. The additional cover (fill) will immobilize near surface contamination. If contaminated soils are excavated, they must be disposed of at an approved facility.

13. Hydraulic Equipment Repair
4550 Brighton Boulevard
Location of TH-15

ISA: Several surface storage tanks are visible in the 1958 aerial photo west of the existing building (4550 Brighton Boulevard) and are shown in Figure 35. City directories do not indicate any establishments dealing with petroleum products existed at this address, however Colorado Petroleum Products (1960, 1957, 1954, 1950, 1945, and 1940) once occupied a site listed at 1800 East 46th Avenue. 4550 Brighton Boulevard and 1800 East 46th Avenue are probably listings for the same address. During the site inspection, a "Petroleum" sign was noted on the building which currently houses Hydraulic Equipment Repair.

S&A: The location of TH-15 was selected to test soils and ground waters for potential contamination related to the Colorado Petroleum Products bulk distribution facility or other sources and to obtain data necessary for a ground water discharge permit.

A soil sample (0-1.5 feet) was analyzed for metals and semi-volatile compounds from TH-15. Lead (170 ppm), within the U.S. Typical Range, PAHs, and two plasticizers were present in the sample. Oils totaling 680,000 ppb, were also detected in the soil sample. Discolored soils were not observed to extend below 2 feet, and there is no evidence these contaminants have impacted ground water. The source of these relatively immobile contaminants is unknown, but the PAHs, oils, and some of the lead could be attributed to Colorado Petroleum Products. Railroad operations on the adjacent UPRR spur line could have contributed to the PAHs. Practices by the current occupant may also be partially responsible.

Ground water recovered from TH-15 contained a low level of chlorinated solvents. Chlorinated solvents were not present in the soil sample from this test hole. See the discussion on the chlorinated solvent plume.

Recommendation: This property has not been identified for acquisition but it was examined in the event modifications to the entrance ramp to eastbound I-70 from Brighton Boulevard might impact this property. Approximately 3 feet of natural clay below the contaminated soils may create a permeability barrier to the downward percolation of water and contaminants. A cover should be provided over the areas impacted by the project to isolate the contaminated material. Excavation of contaminated soils may require disposal in an approved facility.

14. Central Storage Facility (SSI)
4400 Brighton Boulevard
Location of TH-16

ISA: A series of wool and hide tanning operations have been conducted on the premises from 1940 until approximately 1985. City directories indicate the following companies have occupied the structure including Chilewich Corp. (1984 and 1980), Colorado-Utah-Idaho (1976 and 1974), and Colorado By Products Company (1940-1970). Colorado By Products Company (1953 City Directory) was listed as "fertilizer" in this edition. The main environmental concern is that chromium sulfate, acids, formaldehyde or other chemicals used in preservation (tanning) have contaminated soils or ground water.

S&A: The shallow soil sample from TH-16 collected 2.5 feet beneath the concrete surface/cover contained 210 parts per million (ppm) of lead, which exceeds the U.S. typical range (200 ppm) but is below the proposed action levels for remediation of soils near the Globe Smelter (500 to 1,000 ppm). Lead was not detected in ground water sampled from TH-16, therefore the elevated concentration of soil lead has not impacted ground water quality at the site. The concentration of metals in ground water did not exceed MCLs. (See Surface Soil Contamination discussion.)

Recommendation: Minimal environmental risk with acquisition of the northern third of the structure. (See Soil Contamination section.)

15. I-70 Fill Material
(East side of the South Platte River)
Location of SS-1

S&A: A surface soil sample on CDOT property was collected from the fill supporting I-70 west of the Burlington Northern Railroad tracks. The fill area may be reworked during construction.

SS-1 was analyzed for semi-volatile compounds and metals from a depth of 0-1.5 feet. A slightly elevated concentration of zinc (560 ppm) and low levels of PAHs were detected. The results may be related to the nearby former smelter and to the adjacent railroad property.

Recommendation: The concentration of zinc is below the proposed action levels for the Globe Plant (500 to 52,000 ppm). See Soil Contamination section.

16. Katz Property
900 East 46th Avenue

ISA: This triangular shaped property is bounded by the South Platte River, the BNRR tracks, and I-70. According to the City and County Assessor's records which date back to the mid-1940's, there has never been a building at this address. No local sanitary sewer or Denver water lines are present within the property boundaries. City Directories dating back to 1924 do not indicate any entries for 900 East 46th Avenue.

Railroad ties apparently had been dipped in vats containing creosote at this address. Denver Fire Department (DFD) Station No. 9 has records of fire inspections for an A-1 Railroad Tie Company, located at 900 East 46th Avenue, in 1983 and 1986. During a site investigation, five railroad ties were found adjacent to a concrete pad near the gate at the northeast corner of the property. Two small (less than 7 feet in diameter) patches of discolored soil were noted at the site.

S&A: The property gave little visual indication of significant contamination, therefore there was no sampling and analysis.

Recommendation: This property has not been identified for acquisition but acquisition of a small percentage of the site would entail minimal risk.

17. 7-11 Store
1670 East 47th Avenue

ISA: This address appears to have been a parking lot in the 1958 aerial photo and is not listed in city directories prior to 1988 when the 7-11 retail store first appears.

S&A: This property was not tested due to the newness of the fuel tanks (1987), lack of inventory problems, and the location of the potential property acquisition which is not down-gradient to the USTs or dispensers.

Recommendation: No property acquisition is expected for widening Brighton Boulevard from this retail establishment. However, the property was characterized in the event a minor acquisition became necessary as a result of the project's final design.

18. Residential Properties

None of the residential properties identified for acquisition were evaluated for potential contamination due to the minimal environmental risk normally associated with residential properties. However, relocation agents would be alerted to note the presence of household hazardous wastes (e.g., oil-based paints, solvents, pesticides), drums, or other articles of potential environmental concern. Business and residential property owners and tenants would have 30 days following payment to remove such articles prior to CDOT taking possession of the property. Asbestos inspection and abatement would be conducted by CDOT prior to the demolition of any structure.

19. Future Site For Fire Station No. 9

There has not been an evaluation of either site identified by the DFD as preferable for relocation of Fire Station 9. Such an evaluation would need to be conducted to support the feasibility of acquiring either site.

20. Painted Surfaces of I-70

S&A: White reflective paint, containing 53 ppm of total lead, was found on concrete surfaces within the side walls and curbing of elevated I-70. Much of the paint has spalled from the pitted concrete surface. Lead paint and painted debris is classified as a characteristic hazardous waste, according to the Resource Conservation and Recovery Act (RCRA), when leachable lead is greater than or equal to 5 ppm. The paint sample from I-70 was analyzed using the toxicity characteristic leach procedure (TCLP) for lead.

Recommendation: The lead concentration of the extract (less than 0.3 ppm) indicates the paint is not a hazardous waste and not subject to special disposal considerations.

C. AREAS OF CONCERN

The majority of the test results indicated that the project area has few contamination concerns. However, some areas of soil and ground water contamination were discovered within the project area. The environmental problems associated with the contaminants encountered would require that CDOT implement special precautions to protect worker and public health during certain construction activities (like excavation), and would require some specific actions to ensure that, if removal is required, that underground fuel tanks and contaminated material are properly handled.

Ground Water Contamination Ground Water Maximum Contaminant Levels (MCLs) for volatile organic compounds PCE and Benzene were exceeded at different test hole locations (see Underground Storage Tank for discussion of benzene). Concentrations of metals in ground water samples did not exceed MCLs. (See Table T) MCL's were established as drinking water standards by the Safe Drinking Water Act. The state has a more stringent standard for benzene (1 ppb) which would apply for this project. Contaminated ground water should not be threatening drinking water supplies since no private drinking water wells occur within the project area according to the Colorado Division of Water Resources. The nearest public water supply wells are located in Southern Adams County, approximately 4 miles to the northeast.

Chlorinated Solvent Plume

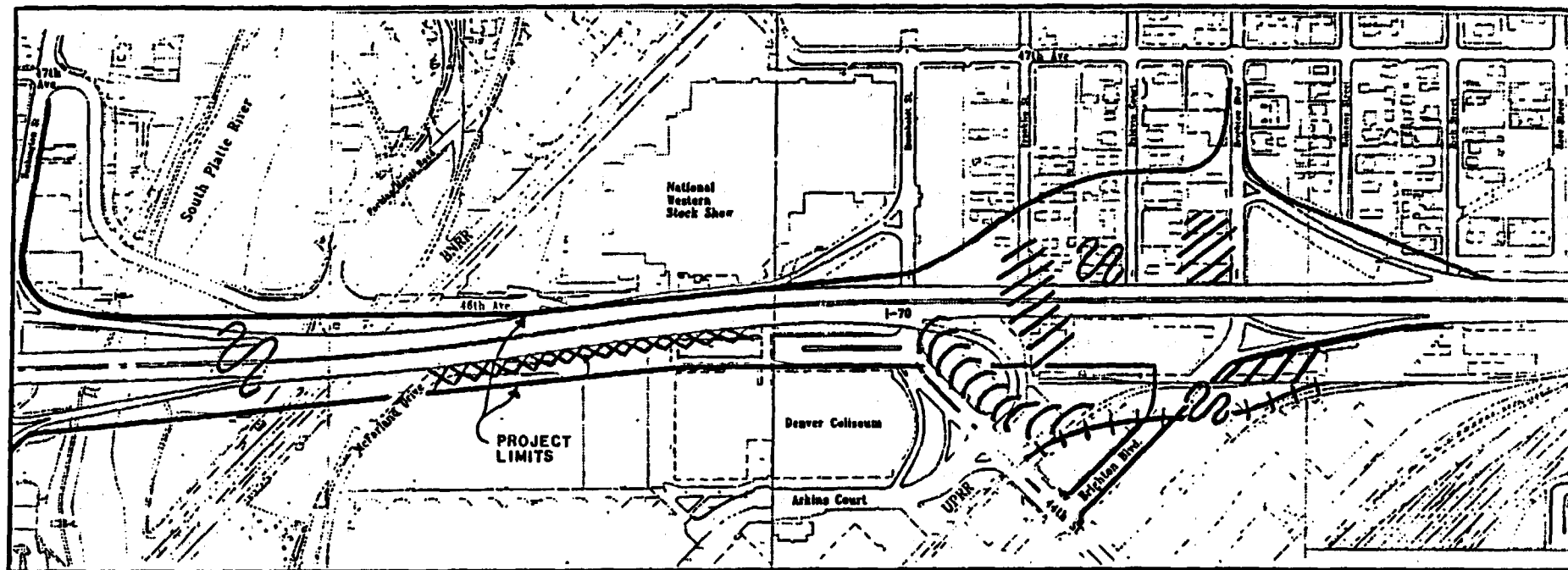
Low levels of chlorinated solvents (TCA and PCE), commonly used as industrial degreasing agents, were detected in ground waters sampled from the majority of test holes east of Humboldt Street. The absence of these volatile organic compounds in soils analyzed and the relatively low levels detected in ground water over a wide area suggests these compounds have migrated to this area from an up-gradient source. If construction activities require dewatering, ground water containing concentrations of chlorinated solvents, which exceed the MCL for a particular compound, may require proper disposal or treatment as required by CDH.

Ground water recovered from TH-6, TH-9, TH-11, TH-12, TH-14, TH-15, TH-16, and TH-18 contained low levels of chlorinated solvents. The analytical results are summarized in Table V. TH-6 also contained methylene chloride at 20 ppb which has no MCL.

Gasoline Contamination

Gasoline contamination was encountered in three test holes on three different properties within the area investigated. (See Figure 36) Lambert Auto Parts (TH-13) is the site of a former service station while O.G. Valentine (TH-10) has an unused tank and the Denver Fire Station (TH-7) tank was recently pulled. The volatile organic constituents of gasoline detected in ground water samples are summarized in Table V.

The analysis of ground water and soils from TH-18 (O.G. Valentine Storage Lot, 4501 Brighton Boulevard) has provided useful up-gradient information southeast of the gasoline contamination detected in TH-7 and TH-10. Ground water has been determined to flow northwest (down-gradient) from TH-18 toward TH-10 and finally to TH-7. Since ground water recovered from TH-18 did not contain similar volatile or semi-volatile gasoline compounds, the contaminant source might be located between TH-18 and TH-10. The surface petroleum storage tanks, formerly located at 4415 Brighton Boulevard or other up-gradient sources, can probably be eliminated as significantly contributing to the documented petroleum contamination in TH-10 and TH-7.



AREAS OF CONCERN

0 300'
SCALE

 ELEVATED METALS

 BLACK FILL

 ELEVATED CHLORINATED SOLVENT
IN GROUNDWATER

 GASOLINE/FUEL IN GROUNDWATER
AND/OR SOIL

FIGURE 36
POTENTIAL SOIL OR
GROUNDWATER
CONTAMINATION

TABLE T
SUMMARY OF VOLATILE AND SEMI-VOLATILE COMPOUNDS AND METALS (GROUNDWATER)

| Compound* or Metal | TH-1 | TH-2 | TH-3 | TH-4 | TH-5 | TH-6 | TH-7 | TH-8 | TH-9 | TH-10 | TH-11 | TH-12 | TH-13 | TH-14 | TH-15 | TH-16 | TH-18 | MCL |
|-----------------------|------|------|------|------|------|------|-------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Benzene | | | | | | | [150] | | | | | | | | | | | 5/1* |
| Toluene | | | | | | | 330 | | | 30 | | | | | | | | 1000 |
| Ethylbenzene | | | | | | | 140 | | | 150 | | | 450 | | | | | 700 |
| Xylene | | | | | | | 620 | | | 500 | | | 210 | | | | | 10000 |
| Methylene Chloride | | | | | | 20 | | | | | | | | | | | | NONE |
| 1,1,1-Trichloroethane | | | | | | 8 | | | | | 6 | 2 | | | 8 | | | 200 |
| Tetrachloroethene | | | | | | 4 | | | [6] | | 2 | 2 | - | 2 | 2 | 2 | 5 | 5 |
| Methyl-Butyl Ether | | | | | | | 3 | | 78 | 170 | | | 110 | 32 | | 5 | 890 | NONE |
| Naphthalene | | | | | | | 10 | | | 280 | | | 260 | | | | | NONE |
| 2-Methylnaphthalene | | | | | | | 5 | | | 150 | | | 130 | | | | | NONE |
| Arsenic | | | | | | | | | | | | | | | | 4 | | 30 |
| Barium | 50 | 90 | 260 | 130 | 270 | 50 | 130 | 50 | 60 | 150 | 50 | 60 | 110 | 50 | 40 | 60 | 40 | 5000 |
| Iron | | | 2000 | | 360 | | | | | | | 20 | | | | | | NONE |
| Lead | | | | | | | | | | 2 | | | | | 2 | 5 | | 11 |
| Manganese | 60 | 500 | 1400 | 1100 | 1500 | | 3600 | 20 | | 3900 | 40 | 210 | 5000 | 30 | 120 | 420 | | NONE |
| Mercury | | | | | | | | | | | | | | | | | 0.2 | 2 |
| Nickel | | | | | | | | | | 20 | | | | | | | | NONE |
| Selenium | | | | | | 4 | | | | | 5 | 3 | 3 | 3 | 7 | 5 | 4 | 50 |
| Zinc | | 20 | | 110 | 30 | | | | | | | 30 | | | | 20 | | NONE |

[] values exceed the MCL
State Standard

TABLE U
CHLORINATED SOLVENTS IN GROUND WATER (ppb)

| Location | Tetrachloroethene (PCE) MCL = 5 ppb |
|----------------------------|---|
| TH-6 (CDOT Traffic Island) | 4, 3 |
| TH-9 NWSS Parking Lot | 6* |
| TH-11 Lambert | 2 |
| TH-12 Elf's Welding | 2 |
| TH-14 Darko's Automotive | 2 |
| TH-15 Hydraulic Equipment | 2 |
| TH-16 Central Storage | 2 |
| TH-18 UPRR Storage Lot | 5 |

Subsequent test

* Exceeds MCL

Potentially leaking underground storage tanks (USTs), located at O.G. Valentine and Denver Fire Station No. 9 (since removed), are two known possible sources of the observed hydrocarbon contamination in TH-7 and TH-10. Although gasoline contaminants were detected in ground water sampled from Denver Fire Department Station No.9 (TH-7), no volatile or semi-volatile compounds were detected in soils. This suggests the gasoline contamination has possibly migrated to TH-7 from an up-gradient source (O.G. Valentine UST). However, the recently removed fire station UST cannot be eliminated as contributing to the contamination detected in TH-7. Acquisition of properties in the vicinity of O.G. Valentine (1608 East 46th Avenue) and the Denver Fire Department Station No. 9 (4600 Franklin Street) would require that either "clean" UST closure reports are filed with the CDH or any remedial measures specified by the CDH are completed.

TABLE V
GASOLINE CONTAMINANTS IN GROUND WATER (ppb)

| Compound | Denver Fire Dept. TH-7 | O.G. Valentine TH-10 | Lamberts TH-13 | Maximum Contaminant Level (MCL) |
|--------------|------------------------------|----------------------------|-------------------|--|
| Benzene | 150* | ND | ND | 5/1 ~ |
| Toluene | 330 | 30 | ND | 1000 |
| Ethylbenzene | 140 | 150 | 450 | 700 |
| Xylene | 620 | 500 | 210 | 10,000 |

* Exceeds MCL

~ State Standard 1 ppb

Underground Storage Tanks Two underground storage tanks (USTs) would require removal because of the proposed project. One UST is an unused tank at O.G. Valentine. The other is a waste oil tank at Lambert's. A third tank was recently removed at the Denver Fire Station 9. When a UST is removed, a report is submitted to the CDH which describes soil and ground water conditions at the site. The remaining soil and ground water would need to be remediated to meet standards set by the CDH in fact it is shown to be the source.

The extent and source of gasoline contaminated ground water in the general area of O.G. Valentine and Denver Fire Department (DFD) Station No.9 has not been determined. The Denver Fire Department will be conducting a corrective action to clean up contaminated soils and ground water encountered during the tank removal of Station 9. (See discussion on Gasoline Contamination.) The benzene concentration (150 ppb) in ground water as tested by CDOT exceeds the state standard of 1 ppb at DFD Station No.9. Gasoline contaminated soils and ground water were also detected at Lambert Auto Parts. The magnitude and volume of gasoline contaminated soils beneath the building at Lambert Auto Parts could not be defined. A building occupies the appropriate sampling location. Ground water at Lambert's and O.G. Valentine's contained gasoline compounds at concentrations below the MCL. Excavated petroleum contaminated soils must be handled as required by the CDH.

Soil Contamination

Concentrations of several Hazardous Substance List (HSL) metals and polycyclic aromatic hydrocarbons (PAHs) were found in soils above background levels on five separate properties. Elevated metal concentration was defined as being those concentrations greater than the U.S. Typical Range (Dragun, J., 1988). Elevated metals in soils were usually accompanied by PAHs. (See Tables X & Y)

Elevated concentrations of metals were discovered in shallow soils at the Denver Coliseum (TH-2), Darko's Automotive (TH-14), Central Storage Facility (TH-16), and the surface soil sample of I-70 fill (SS-1). Relatively low levels of polycyclic aromatic hydrocarbons (PAHs) were discovered in shallow soils at the Denver Coliseum, Darko's Automotive, and Hydraulic Equipment Repair. Oil was also detected in surface soils at Hydraulic Equipment Repair. None of the near surface soil contaminants were detected in ground water. A cover would immobilize the soil contaminants at Darko's Automotive and Hydraulic Equipment Repair. If excavation were to be required, contaminated soils at Darko's Automotive, the Coliseum, and Hydraulic Equipment Repair may require disposal at an approved facility. PAHs often arise from the incomplete combustion of fossil fuels like coal used to heat houses during the early era of Elyria and Globeville.

Black Waste Material

A black waste material containing elevated concentrations of lead, copper, zinc, and other metals was discovered beneath the grounds of the Denver Coliseum and is likely to have originated from past smelting operations in the vicinity. The material was not a characteristic hazardous waste. Ground water at the Coliseum did not contain elevated concentrations of metals. If the black waste is encountered during construction, (it may be avoided depending upon construction methodology) the CDOT would devise a plan of action in coordination with responsible health agencies.

Gross Alpha Radioactivity

No radioactive contamination was detected in the study area by the field screening of soils, however, ground water from seven test holes within the study area contained gross alpha radioactivity which exceeded the MCL (15 pCi/L). The concentration of gross alpha radioactivity ranged from not detected in test hole number 11 (TH-11) to 131 pCi/L in TH-7. The State of Colorado is exempt from complying to the radioactivity standard of the Safe Drinking Water Act (SDWA), since normal background levels of radioactivity found in ground waters in Colorado are commonly elevated. The concentration detected in TH-7 is comparable with concentration detected elsewhere in the metro area.

TABLE W
SUMMARY OF SOILS ANALYZED

| Test Hole | Volatile Compounds* | Semi-Volatile Compounds* | Metals** |
|-----------|---------------------------|--------------------------------|----------------------------------|
| TH-1 | N A | N D (5-35') | N E (5-35') |
| TH-2 | N D (approximately 2') | Detected (5-11.5') | Exceeded (5-11.5') |
| TH-3 | N A | Detected (5-16.5') | N E (5-16.5') |
| TH-4 | N A | N D (5-20') | N E (5-20') |
| TH-5 | N A | N D (5-40') | N E (5-40') |
| TH-6 | N A | N D (5-41') | N E (5-41') |
| TH-7 | N D (25-26.5') | N D (5-41.5') | N E (5-41.5') |
| TH-8 | N A | N D (5-41.5') | N E (5-41.5') |
| TH-9 | N A | N D (5-41.5') | N E (5-41.5') |
| TH-10 | Detected (30-31.5') | Detected (5-41.5') | N E (5-41.5') |
| TH-11 | N D (30-31.5') | N D (5-41.5') | N E (5-41.5') |
| TH-12 | N D (25-26.5') | N D (5-41.5') | N E (5-41.5') |
| TH-13 | Detected (30-31.5') | Detected (30-41') | N E (30-41') |
| TH-14 | N D (30-31.5') | Detected (0-1.5') | Exceeded (0-1.5') |
| TH-15 | N D (0-1.5') | Detected (approximately 2') | N E (approximately 2') |
| TH-16 | N A | N D (approximately 2.5') | Exceeded (approximately 2.5') |
| TH-18 | N A | N D (0-0.5') | N E (0.5-36.5') |
| SS-1 | N A | Detected (0-0.5') | Exceeded (0-0.05') |

* Includes only Target Compound List compounds.

** Metals are listed as detected if any one of the 16 HSL Metals exceed the U.S. Typical Range. (See Table X)

() Sample interval

NA Not Analyzed

ND Not Detected

NE U.S. Typical Range not exceeded

TABLE X
SOIL CONCENTRATIONS OF METALS (ppm) EXCEEDING THE U.S.
TYPICAL RANGE OR URBAN BACKGROUND LIMIT WITHIN THE STUDY AREA

| Metal | U.S. Typical Range | TH-2 Coliseum | TH-14 Darko's | SS-1 I-70 Fill | TH-16 Central Storage | *Urban Background Limit | ASARCO Action Levels ^Δ |
|-----------|--------------------|---------------|---------------|----------------|-----------------------|-------------------------|-----------------------------------|
| Arsenic | 1-40 | 41 | 32 | | | 28 | 70 |
| Barium | 100-3500 | 6600 | | | | | |
| Beryllium | 0.1-40 | | | | | | |
| Cadmium | 0.01-7 | | 13 | | | 8 | |
| Chromium | 5-3000 | | | | | | 73 |
| Cobalt | 1-40 | | | | | | |
| Copper | 2-100 | 1100 | | | | | |
| Iron | 7000-550,000 | | | | | | |
| Lead | 2-200 | 3000 | 710 | | 210 | 413 | 500 to 1000 |
| Manganese | 100-4000 | 12000 | | | | | |
| Mercury | 0.01-0.08 | | 1.7 | | | | |
| Nickel | 5-1000 | | | | | | |
| Selenium | 0.1-2 | | | | | | |
| Silver | 0.1-5 | 19 | | | | | |
| Vanadium | 20-500 | | | | | | |
| Zinc | 10-300 | 25000 | 740 | 560 | | 280 | 500 to 52,000 |

* Urban Background Limit is a CDH guideline

^Δ Proposed action levels for community soils within range of the ASARCO Globe Plant. The lower level represents the action level for soils in edible gardens, the higher for soils in other areas.

No regulatory limits exist for metals in soils, however, Toxicity Characteristic Leach Procedure (TCLP) limits for defining hazardous waste have been established under RCRA. TCLP methodology was applied to the soils of TH-2. The results indicated that the material is not a hazardous waste by characteristics according to RCRA.

D. PROPOSED ACTION

Discussion of Avoidance

The preferred alternative would not impact any sites which are on the National Priority List (Superfund sites), or known to be regulated under the Resource Conservation and Recovery Act (RCRA) or the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

The project area (and all alternatives examined) is within the zone of influence of the Asarco Globe Plant which is regulated under CERCLA. The plant is located approximately one mile north of the project area. It is downgradient from most of the project except where the plant is upgradient at Washington Street and where the groundwater flows to the southeast. The extent and degree of soil, groundwater, and air contamination and alternatives for clean up of the Globe Plant site has been under examination since 1983 with remediation expected to be underway in 1993 or 1994.

The contaminants of concern from the Globe Plant operations - arsenic, cadmium, lead, and zinc, were encountered in some of the soil tests conducted for this project but at lower levels than those of characteristic hazardous wastes as defined by RCRA. The ground water samples were not contaminated with elevated metal concentrations. The former operation of the Omaha and Grant Smelter at the Coliseum ground would be the more likely source of the metal contaminants encountered east of the South Platte River. No metal contamination at elevated levels have been encountered in the project area along Washington Street.

CDOT would follow the standard proposed in late 1992 by CDH and the ASARCO Globe Plant to remediate contamination from the Globe Plant. The proposed action levels for the remediation of soils containing elevated levels of cadmium, arsenic, lead, and zinc can be found in Table X. Proposed remedial actions to minimize exposure to soil metals in excess of the action levels include capping (using for example, soil or asphalt), deep tilling of soil, excavation/disposal of contaminated soils and replacement with clean soils, and exposure controls (for example, industrial areas with restricted access). Cover materials would include a minimum of an additional 12 inches of soils or gravel, or two inches of pavement. Soil areas above any soil action levels would be vegetated or otherwise covered to prevent wind-blown soil movement. Adequate surface water controls would be provided to prevent erosion and/or contamination of surface water.

Avoidance Recommendation

The level of contaminants encountered during PSI investigations indicate that avoidance of the preferred alternative is not required for purposes of avoiding hazardous waste sites. However, steps would be taken to minimize encountering contaminated soils (see the following discussion).

Recommendations from the Regulatory Agencies

CDOT requested comments from the CDH and EPA on the findings of the Preliminary Site Investigation. The following recommendations were made in consultation with CDH. The EPA had no comments.

Black Waste Material

The black waste material discovered in the area of the Denver Coliseum contained elevated levels of seven of the 16 metals on the Hazardous Substance List. A metals analysis conducted according to the Toxicity Characteristic Leach Procedure (TCLP) indicated that the sample from TH-2 was not a characteristic hazardous waste according to the Resource Conservation and Recovery Act (RCRA). There was no metal contamination of the ground water tested in this area.

Wastes which are not regulated by RCRA would be regulated by the Solid Waste Act under CDH. CDH recommends disposing of any of this black excavated material to a permitted waste facility, although it would consider the re-use of the material as fill on CDOT property under a plan approved by CDH. None of this material with elevated zinc concentrations would be approved for use as fill near the Platte River since zinc is toxic to wildlife.

CDOT should minimize the amount of excavation in the vicinity of the Denver Coliseum. If practical, it should consider driving pilings for pier foundations instead of preparing for caissons.

CDOT should conduct additional tests according to the TCLP procedures, at the locations of columns (once their final location is established) and beneath I-70 in areas where 46th Avenue's grade may be lowered. If TCLP test results indicate that the material is a characteristic hazardous waste, then design options would need to be considered which would avoid the waste, options like maintaining the existing grade of 46th Avenue.

Metal Contamination in Soils at Other Locations

Test results from three soil samples from three other sites indicate elevated concentrations of five of the 16 hazardous substance list metals either above the Urban Background Levels or above the U.S. Typical Range and PAH's. No TCLP tests were conducted on these samples since the concentrations were much lower than those found at TH-2. There was no metal contamination in the ground water samples tested.

Unexcavated soils at Darko's Automotive should be covered with a vegetated clean fill material or a concrete or asphalt cover. Conceptual plans indicated that Darko's would be covered beneath the Humboldt to Brighton Boulevard fill section and within a possible terraced, landscaped slope. Conceptual plans indicate that the area of Hydraulic Equipment Repair where the contamination was encountered would not be impacted by this project. If during final design it is determined that Hydraulic Equipment Repair were to be impacted, the same conditions for a cover material would apply.

The I-70 fill between the South Platte River and BNRR from where a surface soil sample indicated elevated metals would be contained with additional fill, walls, and roadway according to conceptual plans. The contractor would be required to take measures to prevent any of the fill material from entering the South Platte River.

Excavated soils from areas where elevated metals were encountered would need to meet the requirements of the Solid Waste Act as discussed under Black Waste Material.

Underground Storage Tanks (UST) and Petroleum Contaminated Soils

There are two known UST which would have to be removed as a part of this project, the unused fuel tank at O.G. Valentine, and the waste oil tank at Lamberts. CDOT would base its initial offer to purchase these properties with the assumption that the property is "clean" of petroleum contamination. If the property owners were to elect to not clean up the contamination (they may not be able to reach the contamination or tanks beneath buildings), CDOT would reduce the offer by the amount estimated to "clean" up the properties to the requirements of CDH's tank closure procedures.

The use or disposal of petroleum contaminated soils under the ownership of CDOT would need to comply with the terms of CDH's UST Owner/Operator Guidance Documents for Investigation, Corrective Action, Use of State Clean-up Action Levels, and Management of Contamination Materials. The terms of section V(e) of the guidance document are currently being specified for application on roadway construction projects in an inter-agency agreement between CDH and CDOT.

Contaminated Ground Water

Ground water is approximately 10' to 18' feet beneath the surface elevations between Washington Street and Humboldt Street, and approximately 28' feet deep east of Humboldt Street. Excavations required for wall foundations and utility relocations are not expected to encounter ground water due to the depth of the ground water. Excavations required for some of the caissons would encounter ground water, but this encounter would be avoided if piles were driven.

If ground water with contaminants at or above MCL limits were expected to be encountered based upon final utility locations and construction techniques, CDOT would obtain a dewatering permit from CDH and from Denver for any water to be discharged into a Denver storm or sanitary sewer. These dewatering permits would establish the parameter of acceptable water quality which may require that the water be treated prior to discharge. Clean ground water could be land applied under a permit approved by the CDH.

Dust Control

Certain metal concentrations in surface soils probably constitute an environmental concern, if excessive dust is generated during construction activities. Implementation of a strict dust control program would ensure that wind blown transport and surface runoff of potentially contaminated soils is limited. Specific properties where dust control should be employed if surface soils are disturbed include Darko's Automotive (1633 East 46th Avenue), Hydraulic Equipment Repair (4550 Brighton Boulevard), I-70 fill material west of the Burlington Northern Railroad tracks, and the Denver Coliseum grounds.

Dust control would include the moistening of surface soils prior to excavation, reworking, regrading, or any other activity which may raise visible dust. Ground cover, whether asphalt, concrete, grass, gravel, etc., would not be disturbed or removed prior to the initiation of construction work at a particular location since exposed soils are more susceptible to wind and water erosion. Where soils are uncovered, sprinkling equipment would deliver a uniform and controlled distribution of water without ponding or runoff. This dust control would be enforced, even when the contractor is not on the project site, until exposed soils are covered with some type of cover which would prevent wind transport.

The contractor would be required to use a water-aided mechanical sweeper daily during construction activities which cause the local roads to accumulate dirt. If necessary, sidewalks would also be cleaned. Hard-packed mud would also be required to be removed daily.

3.14 CONSTRUCTION PHASING

The following objectives were developed in consultation with representatives from the Elyria and Globeville neighborhoods, NWSS, and the Denver Coliseum, to minimize the construction impacts of the project. These objectives were adhered to in developing the proposed construction sequencing and are to be adhered to when the actual construction phasing plans are finalized. See the discussion under Traffic Management this chapter, for other mitigation requirements.

Construction phasing for this project would adhere to the following:

- 1) maintain a minimum of three through lanes of traffic in each direction on I-70 (east of Washington Street);
- 2) minimize disruption of traffic flow on Washington Street, Brighton Boulevard, and 46th Avenue;
- 3) limit the closure of Washington Street and Brighton Boulevard to short-term, night-time closures and do not close either roadway at the same time;
- 4) keep two lanes of 46th Avenue open during construction along existing or adjacent alignments, except for short-term closures or lane restrictions;
- 5) minimize ramp closures with the expectation of no more than four months for any one ramp;
- 6) avoid ramp closures at Humboldt Street/Brighton Boulevard during the annual January Stock Show and disallow the contractor from working in the Coliseum/NWSS area during the January show;
- 7) improve Washington Street between 45th and 47th Avenues sufficiently to handle detouring traffic prior to implementing detours; and
- 8) package the construction of I-70 so that as an individual construction project is completed, I-70, its ramps, and the local roads are left operational in the event subsequent funding is delayed.

Construction of I-70 could take four or more years, depending upon the level of federal funding. For the purposes of the EA, CDOT assumed that funding would be provided in two sums to match the construction of eastbound and westbound I-70. Eastbound I-70 would be constructed first in four stages over a two and one-half year time frame. Construction of the westbound I-70 would follow in three stages over a one and one-half year time frame. This staging may change once design details are refined, and due to actual funding amounts. If staging were to change significantly from that discussed in this section, any new staging plans would have to comply with the objectives noted above.

New eastbound I-70 would be completed and opened to traffic with minimal disruption to either direction of traffic on existing I-70. Once the new I-70 eastbound construction is completed and the westbound I-70 construction has begun, new eastbound I-70 would be used for both directions of travel until new westbound I-70 is completed.

Impact to Ramp Traffic The ramps to and from the interstate at Washington Street, 44th/Humboldt Streets, and Brighton Boulevard would be affected by construction activities during various stages. Generally, traffic flow to or from the eastbound I-70 ramps could be maintained on the existing or new ramps since the new construction would occur south of existing I-70. There would be a short-term closure when eastbound I-70 to the 44th Street exit ramp is closed while constructing the gap between it and the new eastbound exit ramp to Brighton Boulevard. However, traffic flow to or from the westbound ramps would be interrupted for various lengths of time (approximately up to four months) for demolition and reconstruction. These interruptions are unavoidable since the construction of new westbound I-70 and the westbound ramps would be occurring in the areas of existing I-70. Temporary ramps would be constructed for the westbound entrance ramp from Brighton Boulevard and for the exit ramp to Washington Street from westbound I-70 to avoid long-term closures.

Detour routes for ramp traffic would generally use the Washington Street or Brighton Boulevard interchanges, and 46th Avenue. Washington Street between 45th and 47th Avenues would be improved prior to any ramp detours to facilitate the flow of detour traffic.

Washington Street and Brighton Boulevard Short-term overnight closures of Washington and Brighton Boulevard would occur. These closures would be necessary for the placement of structures over these roadways and for other construction activities, like structure painting and concrete pours. Normally, construction would be accommodated leaving portions of the roadway opened. Brighton Boulevard and Washington Street would not be closed completely or under construction at the same time to ensure that there would be an alternate detour route available.

46th Avenue During Construction Traffic would be maintained on 46th Avenue during most all of the reconstruction activities. This maintenance of traffic would be affected by construction activities, i.e., there would be temporary shifts in the alignment of 46th Avenue depending upon where construction is occurring; the number of lanes on 46th Avenue would be reduced to one-lane each direction and on a limited basis traffic-controlled one-way only; and construction-related vehicles would be operating on and around 46th Avenue. And, there would be limited periods of time when 46th Avenue would be closed entirely.

To protect the safety of 46th Avenue travelers and to complete sections of I-70 so that ramp closures can be kept to a minimum, these closures noted above would be absolutely necessary where 46th Avenue passes beneath active overhead construction. These closures would be kept to a minimum, primarily during the nighttime hours. And, barring unforeseen problems, construction vehicles and activities would be barred from interfering with peak hour traffic. Construction activities would be prohibited from interfering with the operations of the annual January stock show and rodeo. See Traffic Management discussion at the end of this section for additional details concerning the stock show and rodeo.

A. CONSTRUCTION PHASING FOR I-70 EASTBOUND

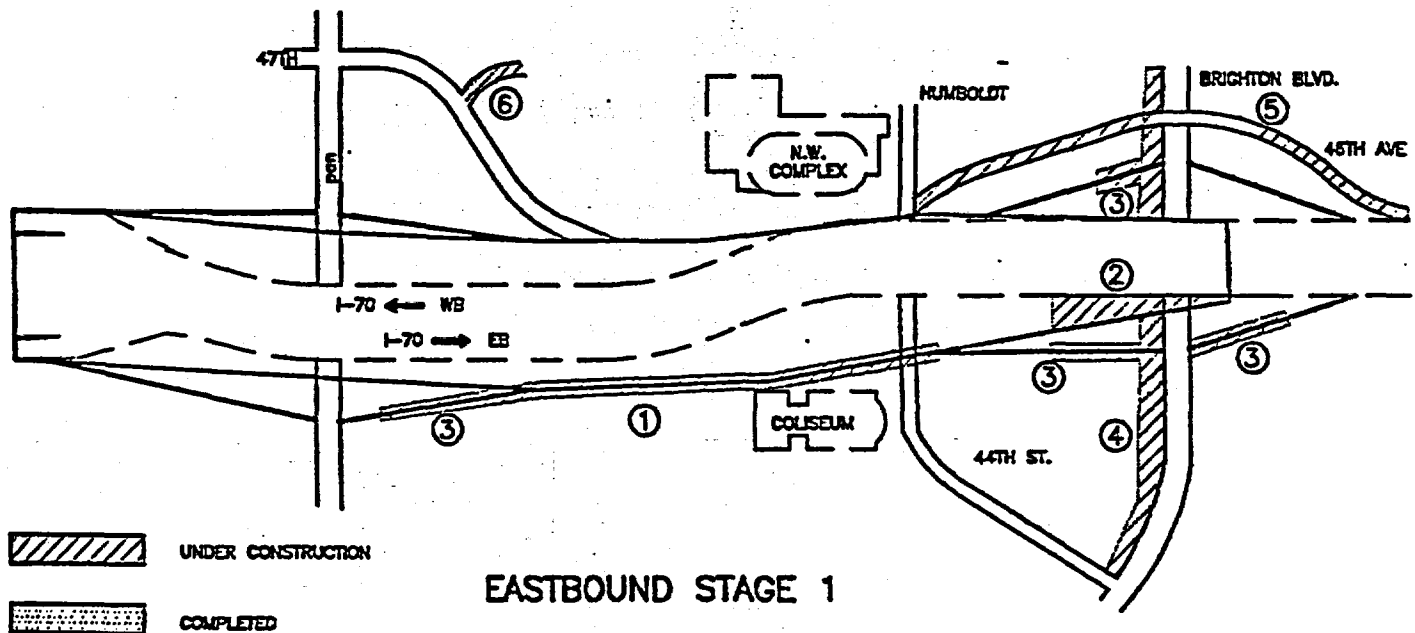
Note: The time frames outlined for construction phasing are based on typical construction activity durations and seasonal weather patterns. Actual time frames for the duration of each stage of construction may change due to information discovered during final design or due to contractor input. However, the objectives noted at the beginning of this section would be expected to be met.

Eastbound Stage 1 - Significant Construction Elements:

- 1) Construct southern-half of new eastbound I-70 between the Burlington Northern Railroad (BNRR) tracks and 44th Street.
- 2) Widen existing I-70 from Brighton Boulevard to the east of the project.
- 3) Realign the Washington Street eastbound entrance-ramp and Brighton Boulevard eastbound entrance-ramp and construct portions of the westbound entrance ramp from and eastbound exit ramp to Brighton Boulevard.
- 4) Reconstruct a portion of Brighton Boulevard between 44th Street and 47th Avenue.
- 5) Construct portions of new 46th Avenue between High and Humboldt Streets.
- 6) Construct the new access ramp to the Greenway Trail.

This stage of construction would take approximately nine months to complete.

Removal of the existing eastbound viaduct would not be required at this time, but would continue to serve I-70 traffic. Portions of new eastbound I-70 would be constructed in sections adjacent to the south side of the existing viaduct. Between Washington Street and Brighton Boulevard, a 25' wide minimum section of I-70 would be constructed. Additionally, construction of major portions of the Washington Street eastbound entrance-ramp and the new Brighton Boulevard eastbound exit-ramp would be phased to maintain traffic on the existing ramps during this stage.



Travel under the new I-70 structures over Washington Street, the Greenway Trail, 44th Street, and Brighton Boulevard, and along the north side of the Denver Coliseum would be disrupted intermittently (including some short-term closures) due to substructure and girder construction. Greenway Trail traffic would be detoured along Washington Street to the new access ramp near 47th Avenue constructed under this stage.

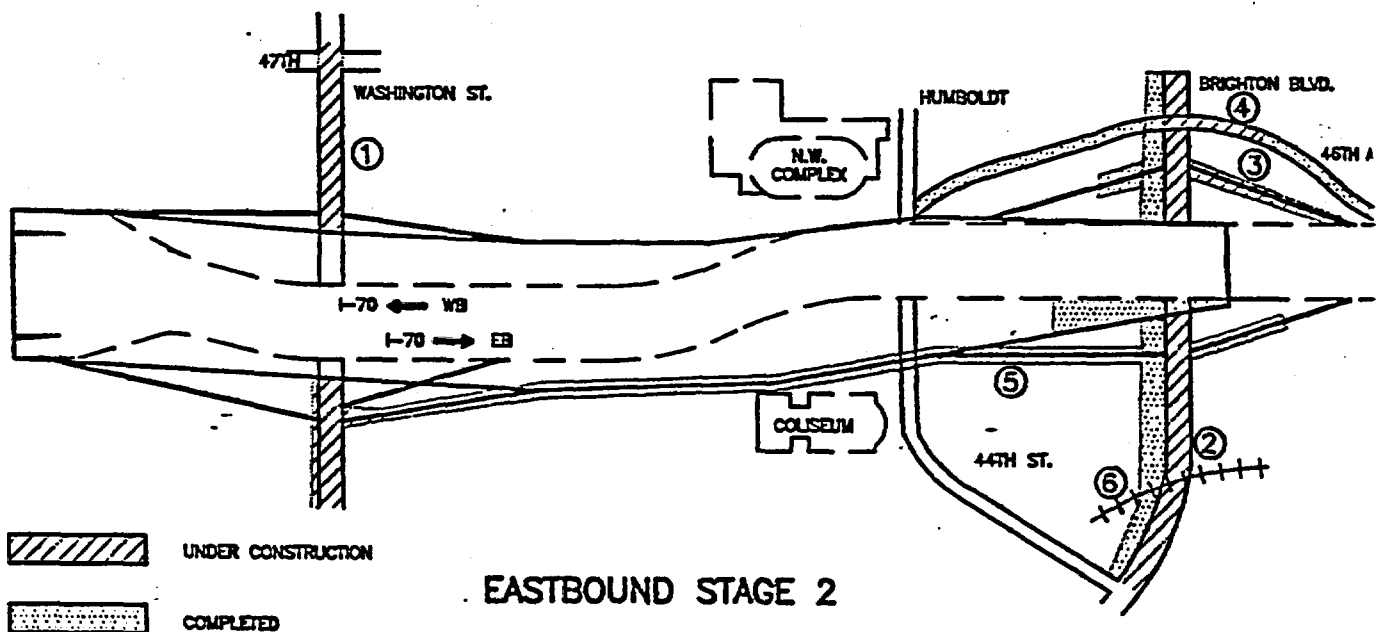
The relocation of pier column(s) near High Street would occur during this stage to make way for the realignment of 46th Avenue. Access to or from 46th Avenue at Steavenson Place or High Street would be denied from the onset of this work and this change would be a permanent condition. Major portions of new 46th Avenue between High and Humboldt Streets would also be completed during this stage.

Disruptions to the outlet of McFarland Drive to 46th Avenue and to the circulatory needs of the Denver Coliseum would be coordinated with the Denver Coliseum. Access to the Reed Mill Lumber Company would be maintained to existing 46th Avenue during this stage.

Eastbound Stage 2- Significant Construction Elements:

- 1) Widen Washington Street - 45th Avenue to 47th Avenue except where precluded by the presence of existing I-70 piers.
- 2) Widen Brighton Boulevard - 44th Street to 47th Avenue except where precluded by the presence of existing I-70 piers.
- 3) Construct the westbound I-70 exit-ramp to Brighton Boulevard.
- 4) Complete 46th Avenue from Brighton Boulevard to High Street.
- 5) Complete the eastbound I-70 exit-ramp to Brighton Boulevard and remove the existing exit ramp to 44th Street.
- 6) Relocate the UPRR spur crossing across Brighton Boulevard.

This stage would require approximately six months to complete.



This stage would complete the eastbound I-70 exit-ramp to Brighton Boulevard. During this stage, eastbound I-70 traffic bound for Brighton Boulevard would be detoured for an approximate one-month duration, until the completion of the new exit ramp. Brighton Boulevard-bound traffic would be signed to use the eastbound spur ramp through the "Mousetrap" to Washington Street. On Washington Street, Brighton Boulevard-bound traffic would travel north to 47th Avenue and east to 46th Avenue to Brighton Boulevard, or south to 38th Avenue to Brighton Boulevard. An alternate detour route would be signed to the York Street exit-ramp, north on Josephine Street, and west on 46th Avenue to Brighton Boulevard. Likewise, Washington Street traffic to eastbound I-70 may be detoured for a

very short duration during this stage. If this detour were to occur traffic would be signed to the 46th Avenue detour to Brighton Boulevard, and then enter I-70 from the Brighton Boulevard eastbound entrance-ramp.

The new westbound I-70 exit-ramp to Brighton Boulevard would be constructed during this stage including the proposed noise wall along the ramp. This work would require the closure of the existing exit-ramp to Brighton Boulevard. This ramp's traffic would detour to Vasquez Boulevard or Washington Street and utilize 46th Avenue for access to Brighton Boulevard. At the conclusion of this detour, which is expected to last approximately four months, the new ramp to Brighton Boulevard would be opened for traffic.

Prior to implementing the detours described above, Washington Street between 45th Avenue and 47th Avenue would be widened during this stage except where precluded by existing piers (see Westbound-Stage 3).

Upon completion of this stage, three of the four new Brighton Boulevard ramps would be in place and operational. The westbound entrance-ramp at Humboldt Street would not be relocated to Brighton Boulevard until the completion of Westbound-Stage 2 activities. Likewise, all other ramps of the Washington Street interchange but the westbound exit-ramp would have been reconstructed by the completion of this stage (see Westbound-Stage 2).

The Union Pacific Railroad (UPRR) spur crossing south of the eastbound Brighton Boulevard ramp termini would be relocated during this stage.

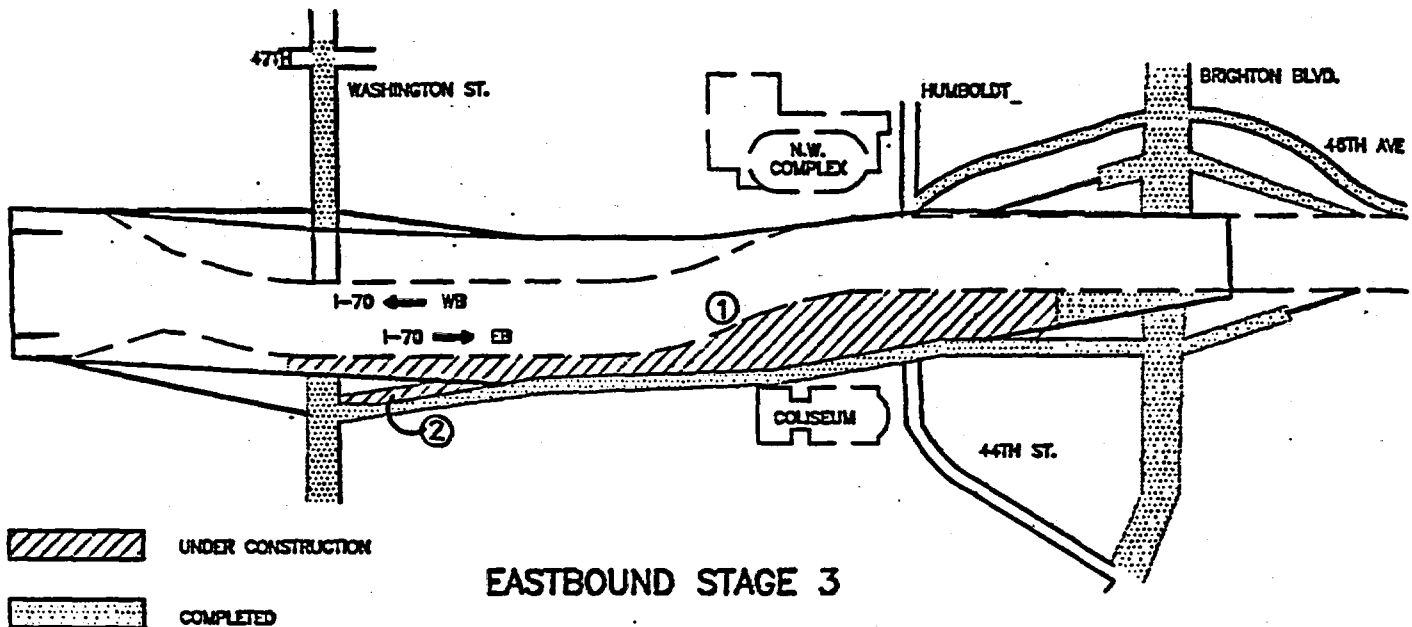
Brighton Boulevard between 44th Street and 47th Avenue would be reconstructed along a westerly alignment except where precluded by the presence of existing I-70 piers (see Westbound-Stage 1).

Once the pier columns east of Brighton Boulevard are relocated, and the existing westbound exit-ramp has been demolished, the remaining portion of the new 46th Avenue between Brighton Boulevard and High Street would be constructed as would the noise wall along 46th Avenue. At the completion of this work, 46th Avenue traffic between High and Humboldt Streets would be shifted to new 46th Avenue, and existing 46th Avenue between these streets abandoned. The abandonment of 46th Avenue would enable the construction of the fill between Humboldt and Brighton Boulevard. Traffic would join existing 46th Avenue west of Humboldt Street during this stage.

Eastbound Stage 3 - Significant Construction Elements:

- 1) Construct additional segments of new eastbound I-70.
- 2) Demolish the existing eastbound entrance-ramp from Washington Street.

This stage would require approximately nine months to complete.



During this stage, construction of a major portion of eastbound I-70 from Washington Street to west of Brighton Boulevard would be done. At the end of this stage, the width of the new bridge would be wide enough for three-lanes of mainline I-70 traffic and one acceleration and deceleration lane between Washington Street and Brighton Boulevard.

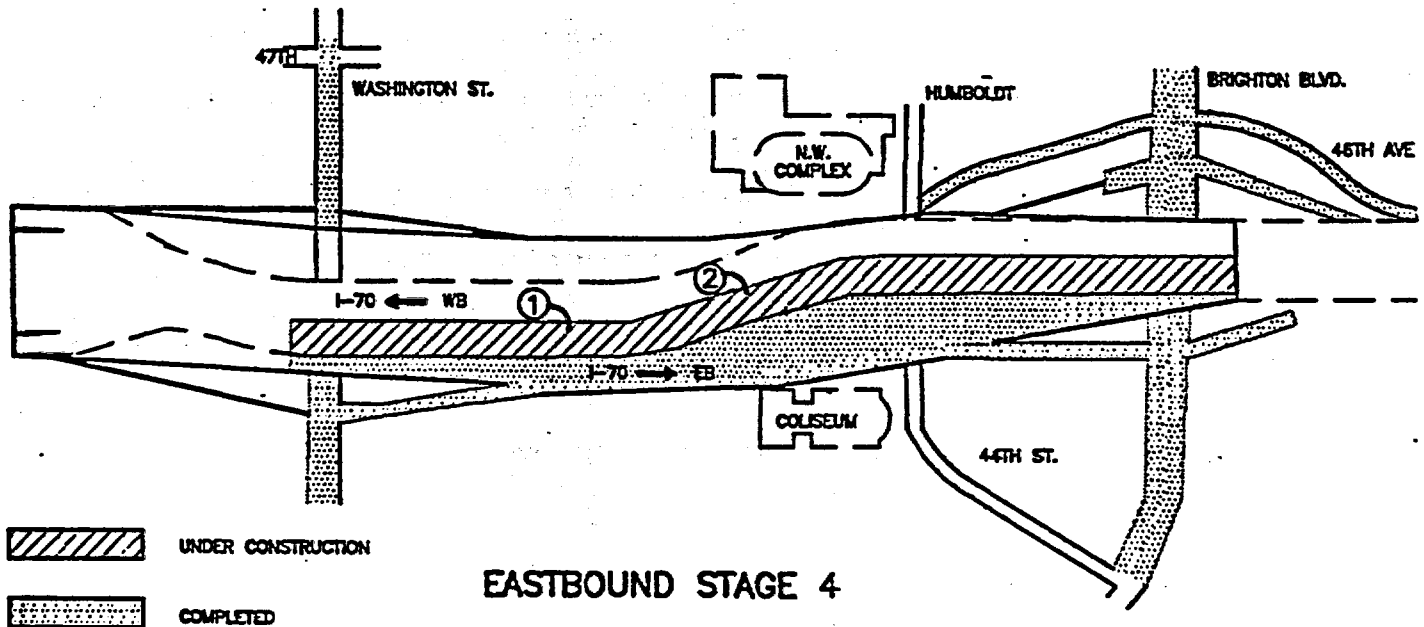
During this stage, eastbound I-70 traffic bound for Brighton Boulevard would be signed to use the eastbound spur ramp through the "Mousetrap" to exit at the Washington Street eastbound exit-ramp, cross Washington Street, proceed up the new Washington Street eastbound entrance-ramp to exit at the new ramp to Brighton Boulevard. An alternate detour route would be signed to the York Street exit-ramp, north on Josephine Street, and west on 46th Avenue to Brighton Boulevard.

Likewise, Washington Street traffic to eastbound I-70 would be signed up the new Washington Street eastbound entrance-ramp, exit to the new ramp at Brighton Boulevard, cross Brighton Boulevard, and then enter I-70 from the Brighton Boulevard eastbound entrance-ramp. These detours would remain in effect until the completion of Eastbound-Stage 3 activities (approximately nine months).

Eastbound Stage 4 - Significant Construction Elements:

- 1) Demolish the existing eastbound I-70 viaduct.
- 2) Construct final phase of new eastbound I-70, east of Washington Street.

This stage would require approximately one year to complete.



When I-70 eastbound traffic is using the three-lanes of new eastbound I-70 completed during Eastbound-Stage 3, the existing eastbound viaduct would be removed so that the remainder of new eastbound I-70 could be constructed. Completion of this work would allow for the shifting of westbound I-70 to these lanes of new eastbound I-70 during Westbound-Stage 1.

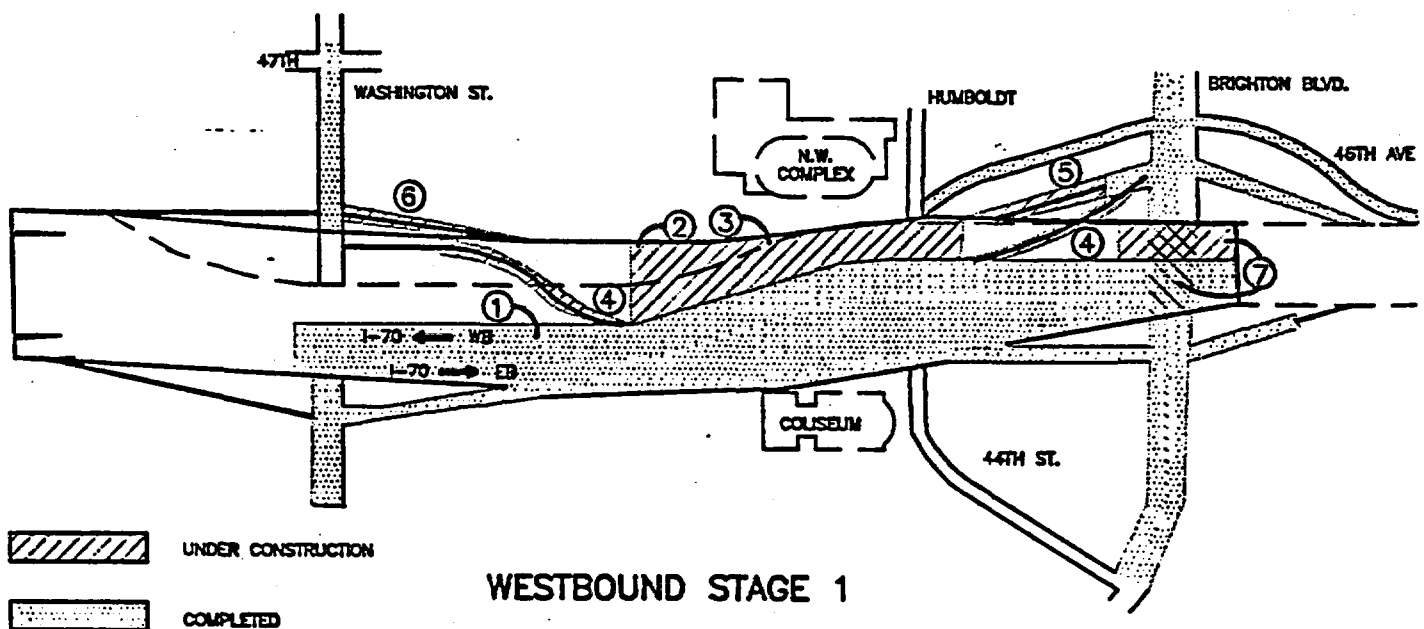
Demolition of the eastbound viaduct would require that existing eastbound 46th Avenue under I-70 between the BNRR and Humboldt Street be closed. Eastbound 46th Avenue traffic would be shifted to existing westbound 46th Avenue where two-way traffic would normally be maintained for approximately nine months. Travel along 46th Avenue in this area would encounter some interferences from construction traffic and I-70 demolition activities.

During this stage, a temporary 46th Avenue between McFarland Drive and 44th Street would be constructed for use during Westbound-Stage 1 activities.

B. CONSTRUCTION PHASING FOR I-70 WESTBOUND**Westbound Stage 1 - Significant Construction Elements:**

- 1) Detour existing westbound I-70 traffic to new eastbound I-70.
- 2) Demolish the existing westbound I-70 viaduct from the BNRR tracks to Humboldt Street.
- 3) Construct new westbound I-70 from BNRR tracks to Humboldt Street.
- 4) Construct temporary ramps to replace the Humboldt Street westbound entrance ramp and the westbound exit ramp to Washington Street.
- 5) Construct portions of the new westbound entrance ramp from Brighton Boulevard.
- 6) Construct the new westbound exit ramp to Washington Street.
- 7) Construct westbound I-70 over Brighton Boulevard and complete the reconstruction of Brighton Boulevard.

This stage would take approximately one year to complete.



Westbound I-70 traffic would be shifted to the new I-70 eastbound section where six-lanes of two-way traffic (plus an eastbound and westbound acceleration and deceleration lane between Washington Street and Brighton Boulevard) would be accommodated. The existing westbound viaduct from BNRR

tracks to Humboldt Street would be demolished including the westbound entrance ramp from Humboldt Street. New structures for the westbound I-70 bridge over Brighton Boulevard and westbound I-70 between the BNRR and Humboldt Street would be constructed.

The westbound exit-ramp to Washington Street, and major portions of the Brighton Boulevard entrance ramp to westbound I-70 would also be constructed. To avoid a long term closure of the entrance ramp from Humboldt Street/Brighton Boulevard and the exit ramp to Washington Street, temporary, low-speed ramps would be constructed for use during this stage. The construction of these temporary ramps is expected to take approximately two to four months. Traffic normally using these ramps would be detoured along 46th Avenue to the ramps at Brighton Boulevard, York Street or Washington Street until the construction of these temporary ramps is complete.

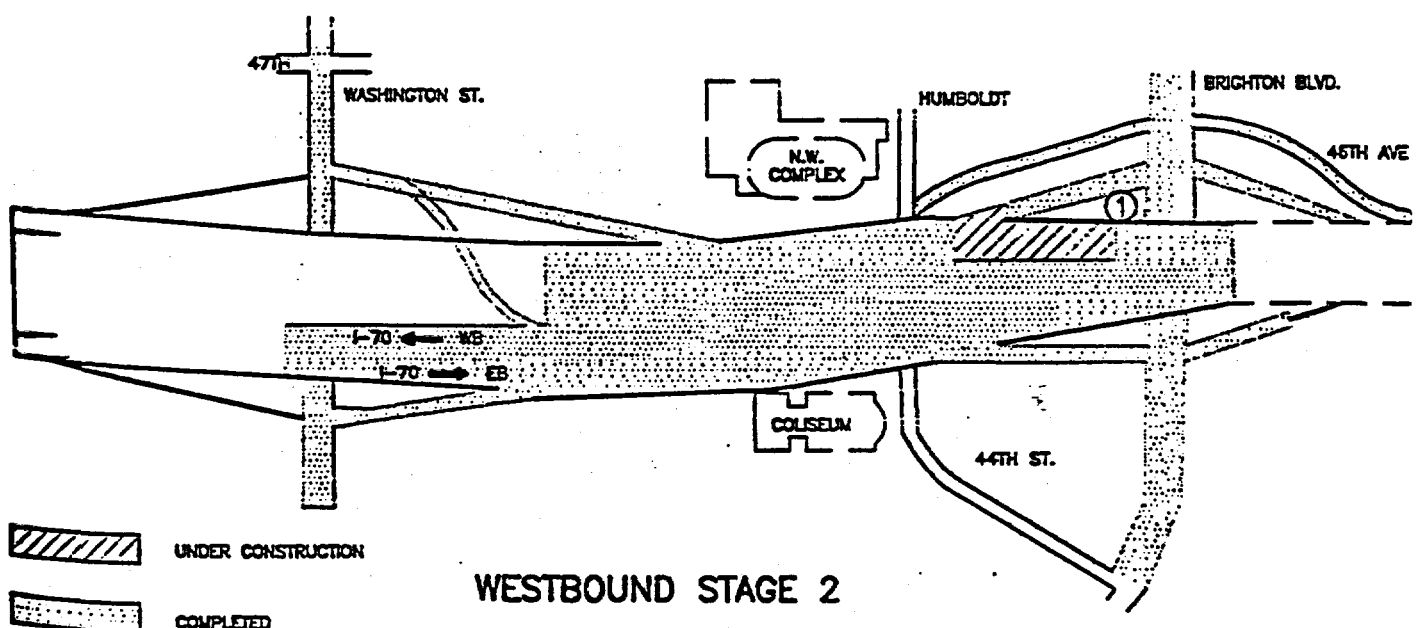
The temporary ramp to Washington Street would be expected to be in operation for approximately 1-1/2 years and the temporary ramp to Brighton Boulevard for one year. Even though the new exit ramp to Washington Street would be completed during this stage, the temporary ramp would need to remain in operation until the completion of Westbound Stage 2. This is due to the fact that Washington-bound traffic could not physically cross onto new westbound I-70 structure except at the location of the temporary ramp.

During this construction, 46th Avenue traffic would travel on a temporary roadway beneath new eastbound I-70. Some closures of 46th Avenue would occur during this stage due to overhead construction of I-70 near McFarland Drive. (See 46th Avenue During Construction discussion at the beginning of this chapter.)

Westbound Stage 2 - Significant Construction Elements:

- 1) Construct new westbound I-70 between Humboldt Street and Brighton Boulevard and complete the new Brighton Boulevard westbound entrance-ramp.
- 2) Build new 46th Avenue beneath new westbound I-70.

This stage would require approximately six months to complete.



WESTBOUND STAGE 2

The temporary westbound entrance-ramp from Brighton Boulevard would be closed during this stage so that new westbound I-70 between Humboldt Street and Brighton Boulevard and the new westbound Brighton Boulevard entrance-ramp could be completed during this stage. Traffic from Brighton Boulevard bound for westbound I-70 would be detoured along 46th Avenue to the ramps at York Street or Washington Street for access to I-70. This detour is expected to be in place between two and four months.

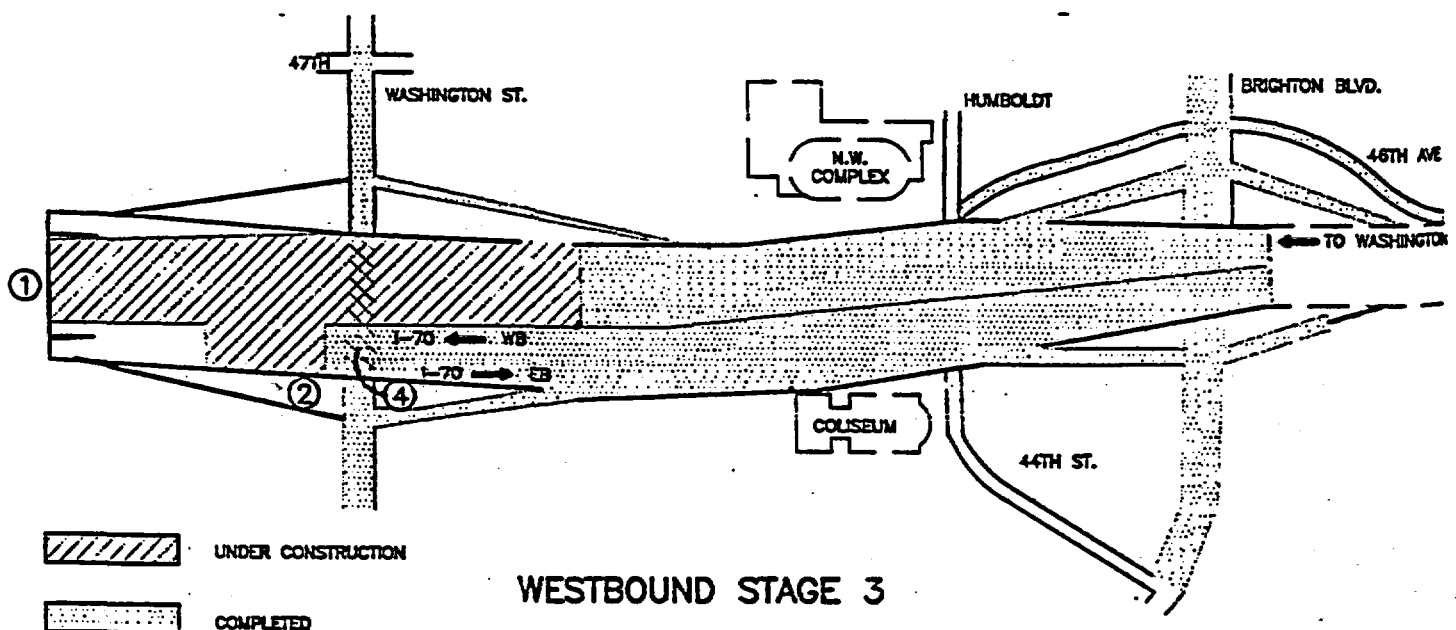
The temporary ramp to Washington Street would continue to operate until the completion of this stage. Final construction of 46th Avenue between McFarland Drive and Humboldt Street would occur during this stage.

At the end of Westbound Stage 2, traffic of the westbound exit-ramp to Washington Street and the Brighton Boulevard entrance-ramp would utilize the new ramps. Traffic to and from these ramps would be separated from mainline westbound I-70 traffic since all mainline traffic would be using the new eastbound I-70 structure until the completion of Westbound Stage 3. (See Westbound Stage 3 - Graphics.)

Westbound Stage 3- Significant Construction Elements:

- 1) Complete new westbound I-70, west of the BNRR.
- 2) Complete new eastbound I-70, west of Washington Street.
- 3) Complete the Globeville noise walls.
- 4) Complete Washington Street beneath new I-70.
- 5) Final striping of new eastbound and westbound I-70.
- 6) Landscape.

This stage of construction would take approximately nine months to complete.



This stage would conclude the construction of the new I-70 by constructing the last new section of I-70 from east of Washington Street to the western project limit (about Logan Street). Construction would be phased to maintain mainline I-70 traffic.

Westbound I-70 traffic to Washington Street would separate from the rest of westbound mainline traffic near Brighton Boulevard and travel on the completed portion of new westbound I-70 to the exit ramp. Brighton Boulevard traffic to I-70 would merge with the Washington Street traffic and exit together to Washington Street. Brighton traffic bound for I-70 from would go through the Washington Street intersection and enter I-70 from the westbound Washington Street entrance-ramp. This traffic pattern would be expected to last the duration of this stage, approximately nine months.

When westbound I-70 between the BNRR and Logan Street is complete, all of westbound I-70 traffic would be moved onto the new westbound I-70. At this time, the remaining construction of eastbound I-70 would be completed to Washington Street from the western project limits (about Logan Street).

After the removal of the piers in Washington Street, this street would undergo its final phase of construction. This work would include putting traffic onto the new lanes of travel, and the demolition of the old sections of Washington Street beneath I-70.

The remaining portions of the noise walls for the Globeville community would be completed during this stage.

Landscaping the project would occur during this stage.

C. TRAFFIC MANAGEMENT

To meet the objectives addressed in "Construction Phasing", detour routes were analyzed to rule out detour routes with potentially "fatal flaws", and to identify additional laneage requirements to mitigate undesirable impacts created by the detoured traffic onto the local street network.

Construction traffic control would be addressed in detail during the design phase by providing traffic control plans which identify the sequence of signs and other traffic control devices to meet each condition encountered. These plans would be based on safe speeds, the volume of traffic being maintained through the construction zone, the duration of the operation and the exposure to hazards. Traffic control measures would be utilized where necessary to prevent detour traffic from using Elyria or Globeville neighborhood streets and from crossing private property (eg. at Den-Col Supply). Local access onto and through detour routes would be maintained with special traffic control, if necessary.

The following are specific recommendations to be addressed in detail during the design phase of this project:

1. Public Awareness Program

Implement a public awareness program similar to that developed for the reconstruction of I-25, that would inform the public of on-going closures/detours during construction and alternate routes to their destination.

2. Advance Signing

This project is unique for traffic control management because the next interchange to the west is a system-to-system interchange (I-70/I-25) within 1/4 mile of I-70/Washington Street interchange. The I-70/I-25 interchange design allows mainline I-70 through traffic to travel eastbound on a flyover structure with the east termini east of the Washington Street

interchange exit. Therefore, a detour design would require traffic travelling eastbound on I-70 exiting at Washington Street to diverge from the I-70 mainline west of the I-70/I-25 interchange onto a spur ramp. Due to this design, special design consideration would need to incorporate adequate advance warning west of the I-70/I-25 interchange. The following are identified advance signing considerations needed to be addressed during design:

Provide adequate advance signing in order to divert eastbound I-70 traffic bound to Brighton Boulevard to exit at Washington Street during eastbound stage 2 and 3 construction phasing. Traffic would need to be diverted west of the I-70/I-25 Interchange. A second detour route would be required to handle traffic that misses the first identified detour. The most likely route for this second detour would be the York Street Interchange, the next interchange east of Brighton Boulevard.

Phasing of overhead signing on I-70 would need to be investigated during each construction phases. All the existing overhead signing structures are mounted to the existing viaduct which would be removed during various phases of construction. Therefore, temporary sign structures may need to be provided for adequate advance warning signs and to inform drivers of the various detours.

3. Signalization

Inevitably, construction activity whether it be on mainline I-70 or on local streets creates delays for drivers on those particular routes. On local streets, particularly at ramp intersections, operations can be improved by modifying signal timing to reflect the change in traffic flow demand and minimize delays.

The following are identified locations where traffic signal timing would need to be revised during various phases of construction:

- o The eastbound exit ramp at Washington Street would require timing adjustments for two detours.
 1. When traffic is detoured to Washington Street because eastbound Humboldt exit ramp is closed during Eastbound Stage 2 construction phasing and traffic is detoured to the Washington Street exit ramp, north on Washington Street and east on 46th Avenue.
 2. When traffic is detoured to Washington Street because the eastbound Humboldt exit ramp is closed and traffic is detoured to the Washington Street exit ramp during Eastbound Stage 3 construction phasing, east through the intersection onto the southern most section of the new eastbound structure route to Brighton Boulevard.
- o The westbound exit ramp intersections with Washington Street would require timing adjustments due to the closure of the westbound exit ramp at Brighton Boulevard during Eastbound Stage 2 construction phasing. Detoured traffic would exit at Washington Street and proceed north on Washington Street and east on 46th Avenue.
- o The westbound exit ramp intersection with Washington Street would require timing adjustments due to the diversion of the westbound entrance ramp at Brighton Boulevard during Westbound Stage 2 construction phasing which is unable to merge with I-70 mainline traffic. Traffic would travel along I-70 between Brighton Boulevard and Washington Street, exit at Washington Street and then proceed across Washington Street and re-enter to I-70 via the Washington Street westbound entrance ramp.

- o Detours through Washington Street must be closely coordinated with the signal timing in order to efficiently move traffic through the interchange and minimize queue lengths between ramp junctions.

4. Timing of Roadway Improvements

Reconstruction of Washington Street between the westbound ramps and 47th Avenue is anticipated to be needed prior to any traffic being detoured along Washington Street. A temporary detour alignment and laneage between the ramps should be investigated to handle the additional traffic being detoured through the interchange.

Additional laneage would be required at Washington Street/47th Avenue during Westbound stage 1 and 2 construction phasing. A temporary second westbound left turn lane is anticipated to be needed.

D. SCHEDULE AND FUNDING

In 1991, the U.S. Congress passed a new law governing funding of the nation's transportation system. This new law, entitled, Intermodal Surface Transportation Efficiency Act of 1991, (ISTEA) drastically changed funding parameters for roadway construction projects. The changes which could affect this project are the limitation on the use of certain types of funding categories on projects which do not include a transit or high-occupancy vehicle component (as this project doesn't) and a significant reduction in the amount of available funds in the "discretionary" pool.

The I-70 Viaduct project has been identified as part of the "Better Mousetrap Complex" in funding requests for interstate discretionary funds. Colorado has been very successful in obtaining funds made available in the previously-provided \$200 million, nationally-distributed, discretionary pool. The new ISTEA law has reduced this pool to \$65 million. Colorado anticipates that it would continue to be awarded discretionary funds until the "Better Mousetrap Complex" project is completed due to Colorado's continuing success in being awarded these funds and because of FHWA's commitment regarding the completion of the Better Mousetrap Complex. Colorado would continue to submit annual applications for these funds, and CDOT would proceed with preliminary and final design and right-of-way acquisitions pending the approval of the Environmental Assessment.

In an effort to keep the citizens who would be affected by this project current with funding and scheduling plans, CDOT has issued differing timeframes about when property acquisitions would be anticipated to begin to meet anticipated construction dates. In 1988 when CDOT first began meeting with the public regarding this project, an aggressive construction start date of 1991 was announced. In 1991, notification of the anticipated construction start date changed to 1994. In 1992, anticipated construction was announced to be 1997 to coincide with CDOT's 5-year plan which identifies the funding for this project under the "Greater Mousetrap Complex" as being 1996 to 1998. The construction start dates have moved from 1991 and 1994 to 1997 since a less-than-necessary allocation of federal discretionary funding has been awarded to first complete other, higher priority projects within the Mousetrap Complex. The priorities in descending order are:

1. I-70/I-25 Interchange (fully funded, completion 1994);
2. I-25/48th to 58th Avenues (two-thirds funded, anticipated final funding allocation 1993, completion 1995, high priority to complete bus/hov lanes and mitigate the closure of the I-25/49th Avenue interchange);
3. I-25/38th Avenue (one-fourth funded, anticipated final funding allocation 1995-97, completion 1998, high priority to complete safety improvements for weaving to and from the I-70/I-25 interchange, and to accommodate Denver's replacement of the 23rd Street Viaduct);

4. I-70/Washington Street to Brighton Boulevard;
5. I-70/Pecos Street (relocation of the westbound exit ramp to 48th Avenue to Pecos Street). This project may occur prior to item 4 if funding becomes available.

Assuming that Colorado continues with its success in obtaining federal discretionary funds, it would be CDOT's intent to pursue the following schedule for this project:

- a. 1994; Purchase land for the relocation of Fire Station Nine, and provide funds for the construction of a new station.
- b. 1995 or 1996; Purchase residential and/or business properties. Which properties would be acquired first would depend upon funding availability, relocation needs, and construction phasing.
- c. In 1996 or 1997 advertise for construction of new eastbound I-70.
- d. In 1997 or 1998 advertise for construction of new westbound I-70.
- e. In 1999 or 2000, complete the reconstruction of I-70.

Re-evaluation of this EA

At the public meeting where the change from an anticipated 1994 construction start date was announced to have changed to 1997, a question was raised as to whether an EA approved in 1993 would have to be re-evaluated if the project was not under construction until 1997. An environmental document can be re-evaluated at any time. An environmental document shall be re-evaluated whenever the FHWA determines that:

1. Changes to the proposed action would result in significant environmental impacts that were not evaluated in the document; or
2. New information or circumstances relevant to environmental concerns and bearing on the proposed action or its impacts would result in significant environmental impacts not evaluated in the document.

However, a re-evaluation would not be necessary where:

1. The changes to the proposed action, new information, or circumstances result in a lessening of adverse environmental impacts evaluated in the document without causing other environmental impacts that are significant and were not evaluated in the document; or
2. The FHWA decides to approve any alternative fully evaluated in an approved final document but not identified as the preferred alternative.

Where the FHWA is uncertain of the significance of the new impacts, appropriate environmental studies would be developed. If, based upon the studies, the FHWA determines that a re-evaluation is not necessary, the FHWA shall so indicate in the project file.

In some cases, a re-evaluation may be required to address issues of limited scope, such as the extent of proposed mitigation or the evaluation of location or design variations for a limited portion of the overall project. Where this is the case, the preparation of a re-evaluation shall not necessarily:

1. Prevent the granting of new approvals;
2. Require the withdrawal of previous approvals; or
3. Require the suspension of project activities; for any activity not directly affected by the re-evaluation. If the changes in question are of such magnitude to require a reassessment of the entire action, or more than a limited portion of the overall action, the FHWA shall suspend any activities which would have an adverse environmental impact or limit the choice of reasonable alternatives, until the re-evaluation is completed.

APR 01 1992

Globeville Civic Association

549 E. 47th Avenue
Denver, Colorado 80226

March 26, 1992

Mr. Bill Vidal
District 6 Engineer
Colorado Department of Highways
2000 South Holly
Denver, CO 80222

Dear Mr. Vidal,

Members of the Globeville residential and business communities were shocked following the most recent community meeting held by the Department of Transportation at the National Western Stock Show Complex where proposals for the reconstruction of the Washington Street overpass were presented. To our profound dismay, ramp closures were again a topic for discussion and although this time they were labeled as "temporary", we can hardly consider them as such due to their stated duration of up to two years. We acknowledge your personal sympathy, however, we find your equating these closures to an economic revitalization initiative as inappropriate and insensitive. We see disruption to our community as lasting now an additional seven years on top of the reconstruction that has already taken place. The business community would be cut off from its supply routes and customers. What company would consider moving here with conditions in such a state of uncertainty for this length of time.

We feel that it is in your best interests as well as ours to immediately reconsider such devastating actions and to explain in detail your more recently claimed alternative design proposals as we have been left with the clear impression by your agents that the two year ramp closure has been "set in concrete".

It is disheartening to have a community initiate redevelopment based on an agency such as McDonald's which may have been helped by an earlier highway project and to then stand back and watch that same business driven out by subsequent construction. We do not believe you would like to see this either. Life to the business community should be better here after construction is completed, however, with your target date for that completion now seven years in the future, realistically our situation cannot be considered guaranteed.

We hope that a more detailed description of this project and its construction alternatives will be brought to the neighborhood in the near future at the next CABA meeting, to residents in a forum within the neighborhood and to the individuals to whom we have sent copies of this letter. We would also like to state for the record that the businesses on Washington Street did not receive notification of the National Western meeting and that a reexamination of your notification process is obviously necessary. Many feel this oversight was intentional.

We appreciate your continued concern and await your response as we are yet awaiting any contact by your agency which confirms your published intention to work with the yet unresolved issues of I-25 access.

Sincerely,
Deborah L. Ortega
Councilwoman Deborah L. Ortega

Paulette Hirsch
Mrs. Paulette Hirsch, Pres. G.C.A.

Mr. Arnold Schatz, Pres. G.A.B.A.

Arnold Schatz

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cc
Mayor Webb
Members of the Denver City Council
Mr. Bill Lysaught, Mayor's Office of Economic Development
Ms Jennifer Moulton, Denver Department of Planning and Community Development
Ms Cathy Chinn, Denver Department of Planning and Community Development
McDonald's Corporation
Members of the Adams County Commission
Mr. Abe Praznick, North Washington Fire Department
Denver Parks and Recreation
Senator Tim Wirth
Senator Hank Brown
Representative Pat Schroeder
Senator Dennis Gallagher
Representative Selena Benevides
Mr. Dave Gaon, Office of the Mayor
Members of the Colorado Highway Commission
Mr. Ray Chamberlain

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